N.S. vol. 15

THE

AMERICAN JOURNAL

OF THE

MEDICAL SCIENCES

FOR JANUARY, 1848.

Art. I.—*Researches into the Comparative Structure of the Liver.* By Joseph Leidy, M. D., (with three plates.)

The following observations* on the comparative structure of the liver were made solely for my own satisfaction, but I have been induced to make them public from the impression that some of the facts presented may be new, or that, at least, the anatomy of the liver being presented in a somewhat new aspect, may be better understood than by former methods of description.

It will be remarked that as respects the anatomy of the liver of vertebrated animals, the facts observed by me corroborate the very carefully made researches and accurate descriptions of the anatomy of the human liver by Mr. Kiernan. (*Philosophical Transactions*, London, 1833.)

The constant presence of the liver throughout the whole of the vertebrate series of animal life and the higher orders of the invertebrate series, is sufficient proof of the importance of the organ, in connection with the digestive apparatus. It is an extensive secreting surface collected into a small bulk, and in the vertebrata it is arranged in such a complex manner, that before the researches of Mr. Kiernan, anatomists entirely failed in obtaining any satisfactory knowledge relative to its arrangement.

Before entering upon the details of the anatomy of the liver, it may be well to examine in a very general manner the nature of secretion and the organs which possess this function. It is rather difficult to give a good general definition of the term secretion, for there are many organic pro-

* These observations were made with an excellent microscope manufactured by Oberhaeuser, of Paris.

cesses which closely resemble it; such are respiration,* the renewal of epithelial surfaces, growth of hair, &c.; but to restrict it in some degree, it may be considered to be that process in an organic being by which certain organic cells, forming part of its composition, separate or form from the nutritive fluid, in contact with them upon one side through the intervention of a basement membrane, certain peculiar substances, which they give up upon the other side, to be appropriated to some other purpose in the organism, or to be cast off as useless, or which would be hurtful if retained.

Particular organs devoted to this function are denominated glands, and the simplest form of a glandular body is a single organic cell resting upon a basement membrane, and having the function just spoken of. Such are probably the cells which secrete the irritating fluid in the *Medusæ*, certain cellules in the *Polygastric animalculæ*, *&c.* An increase of such cells upon a plane surface is a little advance on the former state, and appears almost as simple;—of this character are the glandular patches found in the alimentary canal of insects, &c. The surface upon which the secreting cells are placed, being depressed below the general level, adds a little more to the complexity of the structure, and in this way the simple mucous follicles are formed,—the follicles of the proventriculus of birds, follicles of Lieberkuhn, &c. Should these depressions, which if deep are tubular, be divided towards the extremity, it increases the amount of secreting surface, and renders it more complex,—as in the compound follicles of the stomach, the sebaceous follicles of the skin, &c. If the divisions be subdivided, glands like the salivary, lachrymal, &c., are formed. If, instead of subdivision, the primitive divisions are much elongated, and convoluted to economize space, we have a gland of which the testicle of the higher vertebrata is an example. If the tube be divided and subdivided to a great extent, and each ultimate division forms a reticulated mass of tubular structure, the most complex form of a gland is produced, as in the fully developed liver of most vertebrated animals. The relation of the channels which convey the nutritive fluid to and from glandular organs, of course adds considerably to their complexity. From the foregoing we perceive the complexity of a gland depends upon the extent and mode of arrangement of its secreting surface and the relation of the blood-vessels to it.

The quantity of secreted matter depends upon the number and activity of the organic cells forming a secreting surface, and the quality appears not to depend upon the complexity of the gland, but upon the power of the individual cells; for the same secretion produced in glands of the most intricate arrangement in higher animals, is produced in very simple structures in the lower animals, as instanced in the liver of the higher vertebrata, and that of *Amphioxus lanceolatus*, the testicle of man and that of *Julus*, &c.

* In respiration there is not only a substance derived from the blood and given off externally, but also one derived from the exterior and given up to the blood, so that there is an interchange of substances which is not the case in secretion.

In the lowest forms of vertebrated animal life, where no distinct digestive apparatus exists, we find no trace of biliary structure. When we rise a little in the scale, and arrive at animals with an internal digestive cavity, as the *Polypi*, it is probable that certain of the cells forming part of the parietes of the cavity, may possess the power of secreting a fluid analogous to bile. Certain cellules, also, of the *Polygastrica* may be devoted to this purpose. The few short cœca of the digestive cavity of many *Medusæ* may also be biliary in their nature.

In the *Tænoidea* and *Trematoda*, animals which have a ramiform digestive apparatus, the cœcal appendages have been considered as a rudimentary form of the organ. They, however, do not differ in structure, which is granular, from the main portion of the cavity, and, like the latter, receive part of the alimentary matter. The cœcal appendages of the digestive cavity of the *Echinodermata* are reported as representing the biliary structure, a question, as in several of the former instances, which I have not yet examined. In many *Annelida* there are cœca appended to the sides of the alimentary canal, which are lined by organic cells of small size, and probably secrete a biliary fluid, as in *Hirudo*, *Arenicola*, &c. In the *Myriapoda*, emptying into the intestine, there are several long and delicate tubes of basement membrane lined by secreting cellules, in the *Julidæ* averaging ·0125 millimetre in diameter, which are no doubt of this nature; but as they do not differ in structure from corresponding tubes of insects, a more particular description of the latter will answer for the former.

Insects.—In insects the liver consists of a number of distinct, white, yellow or brown, filiform, tortuous tubes placed in close apposition with the sides of the alimentary canal and opening into it, generally by separate orifices, frequently after joining each other to form short trunks, as in *Musca*, *Tabanus*, &c., in the vicinity of the pyloric extremity of the stomach. The smallest number, which is four, occurs in the flies (*Diptera*); in the *Lepidoptera* there are six; and in the *Orthoptera* and *Hymenoptera* they are numerous. When few in number, they are very long, sometimes three or four times the length of the intestinal canal; when numerous, they are proportionately short, and more delicate. In some insects they terminate in blind extremities, as in many *Diptera;* in others they unite in pairs, at their farthest extremity, so as to form loops, as in the bugs, (*Hemiptera.*)

When more intimately examined, these tubes (Plate I. Figs. 2, 3, 4, 5, 6) are found to consist of a delicate tube of clear, transparent, amorphous basement membrane, the inner surface of which is covered with secreting cells. From the thinness of the tube, the cells often project so as to give it a granulated appearance when viewed by the naked eye, as in the flesh fly, (*Musca carnaria,*) (Pl. I. Fig. 1;) and generally towards the free extremity, the sides of the tubes are so irregular that they appear as if merely folded upon the secreting cells to keep them together.

The secreting cells (Pl. I. Figs. 4, 5, 7) are round, oval, or nearly

cylindrical from elongation. Their average measurement is about ·09 millimetre. The contents are white, yellowish, or brownish, and consist of a finely granular matter, numerous fine oil-globules, a granular nucleus, and a transparent nucleolus.

The cells in the extremity of the tubes are not more than half the size of those, a little farther on, or nearer the termination, and contain less granular matter, and no oil-globules, so that they are more distinct, and the nucleus more apparent. Upon advancing a very little, the cells are found to be of an increased size and full of granular matter, so as considerably to obscure the nucleus from view. A little farther, we find the addition of fine oil globules readily distinguishable by their thick black outline, when viewed in a certain focus. Sometimes the cells become so filled with oil as to be distended with it, rendering the granular matter and nucleus so transparent, as totally to destroy all appearance of the former, and the latter only is to be perceived in faint outline. Such a state I have frequently observed in *Dermestes*, *Ateuchus*, &c.

The nucleus (Pl. I. Fig. 7) is generally central, globular, and pretty uniform in size in the same species, averaging in measurement about ·025 millimetre. Sometimes, as in *Cicada*, &c., where the cells are elongated, the nucleus is also irregularly so. (Pl. I. Fig. 5.)

The nucleolus is always transparent, and measures about ·006 of a millimetre.

The central passage of the tubes, or separation of the cells in the middle line, is usually found filled with fine granules and a great amount of oil globules. (Pl. I. Figs. 4, 5.)

The biliary tubes of insects are bathed in blood or the nutritive fluid, and the respiratory tracheæ are distributed to them with extreme minuteness, but are separated from the secreting cells through the intervention of the basement membrane. (Pl. I. Figs. 2, 3.)

Crustacea.—The liver in the common cray-fish (*Astacus affinis*) of our rivulets, consists of two large lobes, one on each side of the intestine, united by an isthmus anterior to the middle. Each lobe consists of numerous long conical cœca, aggregated together. (Pl. I. Fig. 8.) From each cœcum passes off a narrow duct, to join a common trunk which opens into the intestinal canal, in the vicinity of the pylorus. In structure the cœca (Pl. II. Fig. 9) resemble the tubes of insects, being composed of a sac of basement membrane, within which, originating from the inner surface, are numerous secreting cells. The cells are more or less polygonal in form from mutual pressure. In the bottom of the cœca, the cells (Pl. II. Fig. 10) are small, with an average diameter of ·02 millimetre, and contain a finely granular matter of a yellowish hue, with a granular nucleus, and a transparent nucleolus. As we proceed from the bottom onwards, the cells (Pl. II. Figs. 11, 12, 13) are found to increase in size, and to obtain a gradual addition of oil globules, until beyond the middle of the tube where

they are found filled with oil, so as to have the appearance of ordinary fat cells, and have a diameter averaging ·06 millimetre. From this arrangement of the cells, when a cœcum is viewed beneath the microscope, (Pl. II. Fig. 8,) its lower half appears filled with a finely granular matter intermingled with nucleolated nucleated bodies, and the anterior half, with a mass of fat cells, the nucleus hardly visible, from the property of oil rendering organic tissues more or less transparent. The central cavity of the cœca is filled with fat globules, and a finely granular matter corresponding to that in the interior of the cells.

Mollusca.—The liver of the slug (*Limax*) and snail (*Helix*) consists of five lobes which are subdivided into lobules, (Pl. I. Fig. 16,) and each lobule is composed of numerous bulbiform cœca, polygonal from mutual pressure. From each of these passes off a duct, which by union form two trunks opening into the duodenum.

When one of the bulbiform cœca (Pl. I. Fig. 16) is examined beneath the microscope, it is found to have a structure differing in no important particulars from that of the cray-fish. The cells (Pl. II. Fig. 17) at the bottom of the sac average ·02 millimetre in diameter; those towards the other extremity about .04 millimetre. Some of the fully ripe cells (Fig. 18) are filled with innumerable minute globules of oil hardly distinguishable from the granular matter; others (Fig. 19, *a*, *b*, *c*) with globules of a larger size; some (Fig. 21) are found with from one to ten, or more, large, deep yellow oil globules in the centre; a few (Fig. 22) with a hard, or crystallized mass of fat in the centre; and many (Fig. 20) are distended with oil. By pressing the cells (Fig. 23) between two plates of glass, the contents will be squeezed out, and the structure will be seen as follows:—The vesicular, transparent, amorphous cell wall, finely granular matter, fat globules, and a granular nucleus, measuring about ·01 millimetre, and containing a hard, transparent nucleolus. A few of the cells contain two nuclei.

The blood-vessels, consisting of arteries and veins, form a rete around the bulbiform cœca, but do not appear to come in immediate contact with the secreting cells. Along the course of these vessels, and attached to them, numerous nucleated fat cells exist, and the white opaque colour, which often renders these vessels so conspicuous, as they ramify in the brown-coloured liver, I find arises from innumerable minute oil globules attached to every part of their parietes.

Vertebrata.—In vertebrated animals the liver is of large size and of no general regular form. It is usually divided by deep fissures into several portions or lobes, which are invested by the peritoneum. In colour it passes through all the shades of light pink or nearly white, yellow, red, brownish purple, and brown. When the surface is closely examined beneath the transparent peritoneum, it will be found to have somewhat the appearance of a mosaic structure, a dark ground inlaid with small portions of a lighter

colour. In intimate structure it consists of numerous, small, irregular bodies, or lobules (lobules of Kiernan), corresponding to the lighter portions just mentioned, which are lobulated themselves and closely connected together by means of white and yellow fibrous tissue and the blood-vessels belonging to the organ, which correspond to the dark ground lines separating the lighter-coloured masses. The lobules are not regularly arranged side by side throughout the liver, but lie in all directions, principally, however, with their long diameters at right angles to the surfaces. When the vessels of a liver have been injected, and the organ then hardened in alcohol so that it may be rendered more consistent and its difference of structure more perceptible, and a section made at right angles to the surfaces of the organ, a view like Fig. 31, Pl. III., will be obtained. In such a section lobules will be observed to be cut in all directions; longitudinally, when they have a foliated appearance; obliquely or transversely when they have a more or less polygonal form depending upon the amount of mutual pressure at any part of the liver, being greatest in the interior, least near the surface. In their interior, sections of blood-vessels are seen, which belong to the hepatic veins; and the vessels occupying the interspaces between them are branches of the hepatic artery and vena portarum. The lobules are composed of an intertexture of biliary tubes, (pori biliari,) (Pl. III. Fig. 32,) and in the areolæ or interspaces of the network the blood-vessels ramify and form amongst themselves an intricate anastomosis, the whole being intimately connected together by a combination of the white fibrous and yellow elastic tissue.

In structure the biliary tubes (Pl. II. Figs. 25, 28; Pl. III. Figs. 33, 34), correspond with those of the invertebrata, consisting of cylinders of basement membrane containing numerous secreting cells, and the only difference exists in the arrangement; the free tubes of the lower animals in the vertebrata becoming anastomosed or forming an intertexture. The tubuli vary in size in an unimportant degree in different animals, and also in the same animal, being generally from two to two and a half times the diameter of the secreting cells. The tubes of one lobule are distinct from those of the neighbouring lobuli, or only communicate indirectly by means of the trunks or hepatic ducts originating from the tubes and lying in the interspaces of the lobuli. The secreting cells (Pl. II. Figs. 25, 26, 27, 29, 30; Pl. III. Figs. 35, 36, 37) are irregularly angular, or polygonal in form from mutual pressure, and line the interior surface of the tubes. They vary in size in a moderate degree in different animals and also in the same animal, appearing to depend upon certain conditions of the animal and liver. The colour is light yellowish, or brownish when in mass, the other and darker colours of the liver appearing to depend upon the blood in the organ. They contain a finely granular matter, oil globules, a granular nucleus, and a transparent nucleolus.

The finely granular matter is the portion from which the colour of the

cell is derived; it appears to be made up of innumerable exceedingly minute spheriform granules, which, when under a low power of the microscope and well defined, look like so many minute black points. This substance, from its quantity and minute state of division, often obscures the nucleus so that it cannot be distinguished until acetic acid is applied to it, when it is rendered more translucent without affecting the nucleus. The oil globules vary in quantity in different conditions of the liver, and in different cells. It exists in the form of exceedingly minute globules, looking like so many intensely black points, and hardly perceptible from the granular contents of the cells, up to larger and distinct globules, sometimes one-fourth the diameter of the cell. From this gradual advance from the state in which it is hardly distinguishable from the granular matter up to a large size, and in the invertebrata even to a distended state of the cell, a gentleman, to whom I presented the observation, supposed that the liver only secreted fatty matter, while the gall-bladder secreted cholesterine, the latter fact being presented to his observation in several pathological cases, in which the cystic duct was obstructed and the bladder filled with white concretions (biliary calculi), which consisted of pure cholesterine. This, which appears plausible at first view, falls at once to the ground when it is recollected that some animals have no gall-bladder, as the horse, sloth, &c., and yet secrete a bile constituted like that of animals possessing a gall-bladder. The giraffe, it is also well known, in the three or four cases in which the animal has been dissected, in two cases had no gall-bladder, and in a third instance possessed one of large size. I have mentioned that the quantity of oil globules varies in different conditions of the animal or organ. If the animal be very fat, or be well fed, especially on substances containing much starch, it will be found in greater abundance than usual; as may be readily seen in the difference between poultry which run about and those which are penned up for fattening; and I have no doubt that in the preparation of the liver of geese, in which it becomes enormously enlarged, for making the "*paté de foie gras de Strasbourg*," there is not the addition of a single secreting cell, but merely an accumulation of fat globules, within the secreting cellules, derived indirectly from the starchy matters of the food, which ordinarily are consumed in the process of respiration. In phthisis, in which more or less of the respiratory surface is destroyed, the liver appears to take upon itself part of the office of the lungs, but rids the blood of the excess of carbon in another way, that is by converting it, with the elements of water, into fat, which is deposited within the cells, producing what is called "fat liver." The same condition of the liver is produced in drunkards, probably from the stimulation to nutrition and the conversion of the alcoholic constituents into fat. It is also produced in some other ways not well understood, as was presented to me lately in a case of Prof. S. Jackson's, in which the patient had laboured for a long time under disease of the liver and dyspepsia, and died of hemor-

rhage from the bowels consequent on extensive ulceration of the mucous membrane.

The nucleus is generally central, frequently lateral, globular, and pretty uniform in size in the same animal. It is granular in structure and never contains oil globules; generally, it is but indistinctly seen, excepting in fishes and reptiles, and frequently not at all, from the granular contents of the cell obscuring it, but is readily brought into view by the influence of acetic acid upon the latter. Sometimes there are two nuclei instead of one.

The nucleolus measures about ·001 millimetre, is round in form, consistent, and transparent, and is situated in the centre of the nucleus.

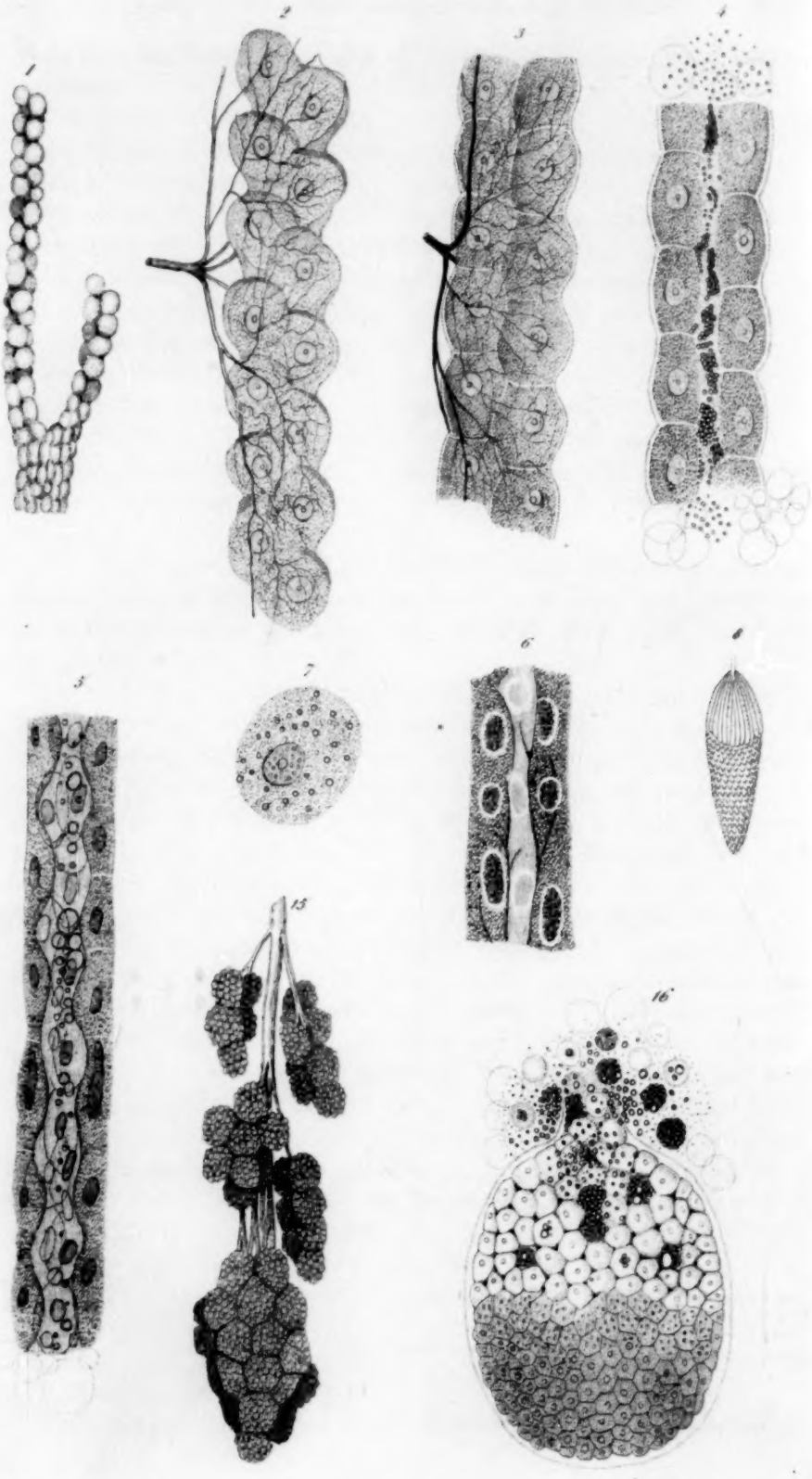
The interlobular trunks or commencement of the hepatic ducts, as they originate from the biliary tubes or pores, run in varied directions in regard to the lobules, and freely anastomose with each other, and by their convergence form trunks which take a general course at right angles to the surfaces of the liver, and finally appear by several trunks externally beneath the liver.

The blood-vessels (Pl. III. Figs. 38, 39) of the liver consist of two sets, the hepatic artery and vena portarum, which convey the blood to it, and a third set, the hepatic veins, which conducts the effete blood from it into the general circulation again.

The hepatic artery, much smaller than the vena portarum, appears to be appropriated to the nutrition and supply of oxygen to the tissues entering into the composition of the liver; while the vena portarum is probably devoted to the conveyance of blood to the secreting cells, which appropriate the peculiar fluid of the liver, or bile from it. These two vessels enter the liver at the place of exit of the hepatic ducts, and follow the same course inwards that the latter did in coming out. The artery in its passage supplies the ducts with branches and the vena portarum with vasa vasorum. In the intervals of the lobules they comport themselves very much in the manner of the interlobular ducts, and form an intricate network around the lobules, but whether the two sets of vessels anastomose I could not satisfactorily determine. They both send off numerous branches which enter the lobules at right angles to the length of the latter, and form an intricate plexus by turning through the interspaces of the biliary tubes. The vessels within the lobules freely communicate with each other and converge towards their interior, where they terminate in trunks, which run in the length of the lobules, and are the commencement of the hepatic veins. This free intercommunication of the three sets of vessels within the lobules has been fairly proved to me by a minute injection of a young liver, by Prof. Wm. E. Horner, of the University. All three of the vessels have been injected with red size, and it has penetrated beautifully, and a fine section from almost any part of it, beneath the microscope, has the appearance represented in Fig. 39.

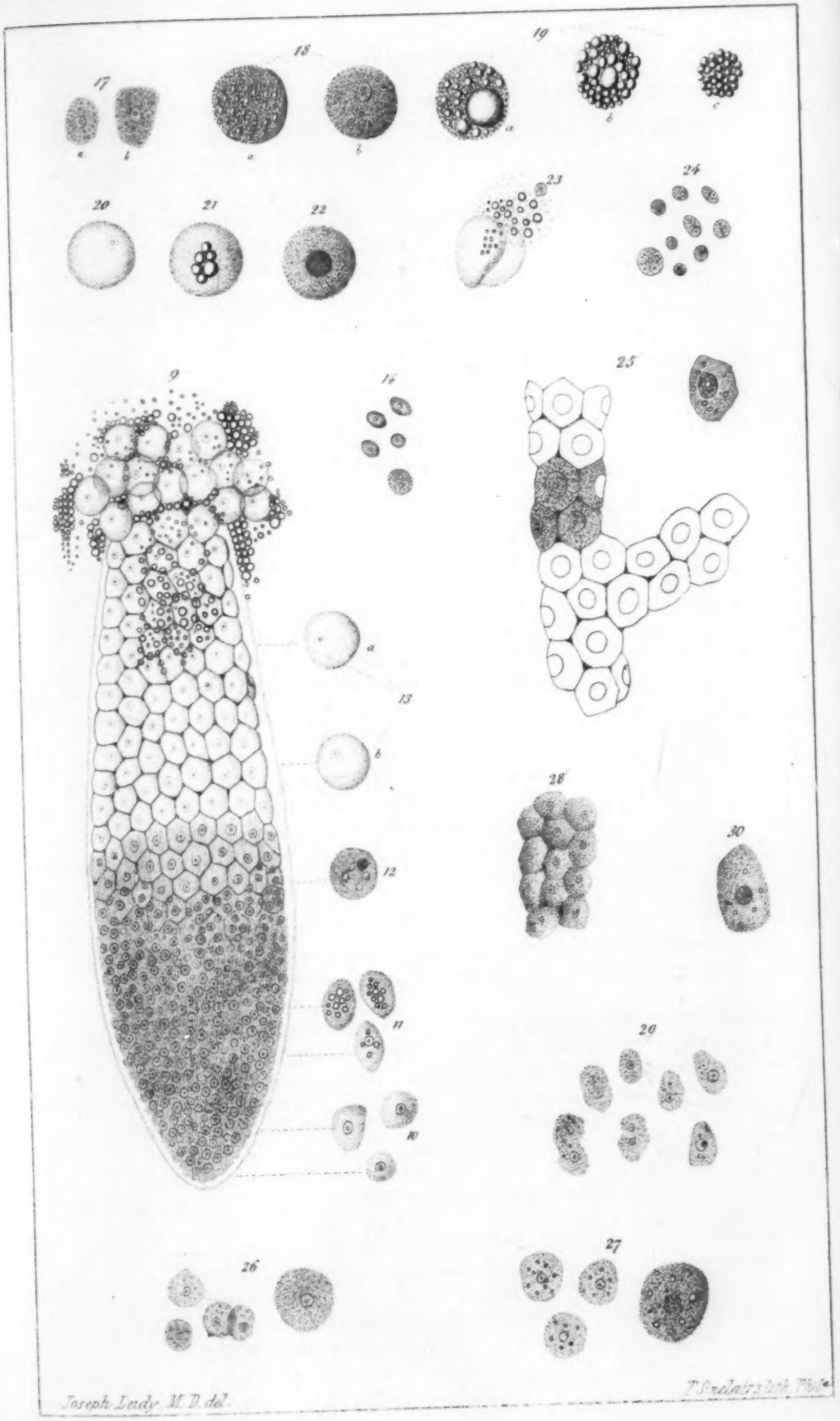
The commencing branches of the hepatic veins issue from the base of

Plate 7



Leitgeb M. D. del.

T. Sinclair's lith. Phil.


17
a
b
18
a
b
a
19
b
c
20
21
22
23
24
9
14
25
a
13
b
12
28
30
11
10
29
26
27
Joseph Leidy M.D. del.
T. Sinclair's lith. Phila.

the lobules, and by their convergence, form several large trunks, which pass out of the liver at right angles to the other two sets and parallel to its surfaces, at its dorsal margin close to the spinal column.

Measurement of the Secreting Cells of the Liver of some Animals.

Centiped (*Julus impressus*) cell, .0125.
Tumble bug (*Ateuchus volvens*) cell, longest diameter .0225 m.; shortest, .0125 m.
Katydid (*Platyphyllum concavum*) cell, .13 m. in length; nucleus .0225 m.
House-fly (*Musca domestica*) cells, .09 by .06 m.; nucleus .0225 m.
Flesh-fly (" *carnaria*) cell, .09 m.; nucleus .0275 m.; nucleolus .006 m.
Cray-fish (*Astacus affinis*) cell, .02 to .06 m.; nucleus .015 m.
Snail (*Helix albolabris*) cell, .02 to .04 m.
Slug (*Limax variegatis*) cell, .03 to .06 m.
Rock fish (*Labrax lineatus*) cell, .0275 m.
Minnow (*Hydrargira ornata*) cell, length .02 m.; breadth .015 m.
Cat-fish (*Pimelodus catus*) cell, .0275 m.
Lizard (*Triton niger*) cell, .03 m.; nucleus .0125 m.
Frog (*Rana halecina*) cell, length .03 m.; breadth .02 m.; nucleus .005 to .01 m.
Terrapin (*Emys terrapin*) cell, .03 m.
Snake (*Tropidonotus sirtalis*) cell, .02 to .0275 m.
Boa (*Boa constrictor*) cell, .03 m.; nucleus, .0150 m.
Duck (*Anas acuta*) cell, .0175 to .02 m.; nucleus .006 m.
Owl (*Strix brachyotos*) cell, average .015 m.; nucleus .005.
Chicken (*Gallus domesticus*), *lean*, cell .016 m.; *fat*, .017 m.
Ground Squirrel (*Sciurus striatus*) cell, .0175 m.
Gray " (*Sciurus Carolinensis*) cell, .015 m.
Rabbit (*Lepus Americanus*) cell, largest .03 m.; smallest .015 m.; nucleus .01 m.
Sloth (*Bradypus tridactylus*) cell, .0133 m., remarkably distinct.
Leopard (*Felis leopardis*) cell, .0125 to .015 m.
Monkey (*Simia* ———?) (*American*) cell, .015 m.
Man—cell, largest .03 by .02 m.; smallest .015 m.; average .02 m.; nucleus .009 m.; nucleolus .001 m.

Explanation of Plates I., II. and III.

Fig. 1 Represents a portion of a trunk and two branches of one of the biliary tubes of the flesh fly (*Musca carnaria*), viewed by reflected light, and magnified 8 diameters.

" 2, Portion of a biliary tube of the flesh fly, highly magnified, exhibiting the arrangement of the secreting cells, and the mode of distribution of the tracheæ.

" 3, From the house fly; exhibiting the same as fig. 2, with the exception of a different form of the cells.

" 4, Portion of a biliary tube from the house fly, highly magnified. The secreting cells are seen ranged upon each side with a passage between the rows, which is filled with oil globules.

" 5, 6, Portions of a biliary tube from the katydid (*Platyphyllum concavum*), exhibiting the elongated cells and nuclei.

" 7, A secreting cell from the liver of the flesh fly, very highly magnified. The nucleus with its nucleolus is seen near the centre of the cell, and distributed through the latter are seen numerous oil globules.

" 8, Portion of the liver of the cray fish (*Astacus affinis*), magnified 3 diameters, and exhibiting the structure of cœcal tubes.

Fig. 9, A cœcum or biliary tube of the cray fish (from an individual which was one inch in length and had been well fed for some time), highly magnified. At the bottom is seen a confused mass of cells with their nuclei and nucleoli, but at the upper part of the sac they are seen distinct, and polygonal from pressure, and filled with oil which renders them transparent. At the mouth or open extremity numerous detached cells and oil globules are perceived, which have been squeezed out by the pressure of a thin plate of glass.

Figs. 10, 11, 12, 13, a, b, Exhibit the progressive change of the cells as they advance from the bottom of the tube.

Fig. 14, Nuclei, from the secreting cells of the liver of the cray fish, highly magnified.

" 15, Portion of the liver of the snail (*Helix albolabris*), moderately magnified, exhibiting the arrangement of the lobules.

" 16, A biliary cœcum from the liver of the snail, highly magnified. It shows the same structure as fig. 9.

" 17, a, b, Two cells, from the bottom of a biliary cœcum of the snail, highly magnified.

" 18, a, b, Two cells, more advanced, containing numerous very minute oil globules.

" 19, a, b, c, Three cells, containing larger oil globules.

" 20, A cell distended with oil.

" 21, A cell containing nothing but six deep yellow consistent oil globules.

" 22, A cell containing a hard yellow mass of fat.

" 23, A cell ruptured and its contents escaping.

" 24, Nuclei, from the cells of the liver of the snail, highly magnified.

" 25, Portion of a biliary tube and secreting cells, from the liver of a lizard (*Triton niger*), highly magnified.

" 26, Secreting cells, from the liver of an owl (*Strix brachyotos*), highly magnified.

" 27, " " from a duck (*Anas acuta*).

" 28, Portion of a biliary tube of the rabbit (*Lepus Americanus*), highly magnified.

" 29, 30, Secreting cells from the liver of the rabbit.

" 31, Longitudinal section of human liver from the posterior part near the upper surface, magnified 3 diameters, from a preparation made by Prof. W. E. Horner of the University of Pennsylvania. The three sets of blood-vessels were injected with colouring matter and the preparation then preserved in alcohol. The blood-vessels represented in the drawing belong to the hepatic veins, and are seen at various parts coming from the interior of the lobules. The spaces between the lobules, which are filled with branches of the hepatic artery and vena portarum and hepatic ducts, have been purposely left white so as not to obscure the view of the lobules.

" 32, Transverse section of a lobule of the human liver, taken from the same preparation as fig. 31, highly magnified, and presenting to view the reticulated structure of the biliary tubes. In the centre of the figure is seen the hepatic vein cut across and several small branches terminating in it. Where the injecting matter did not run freely, it is seen standing in dots along the course of the vessels. At the periphery are seen branches of the hepatic artery, vena portarum and hepatic duct.

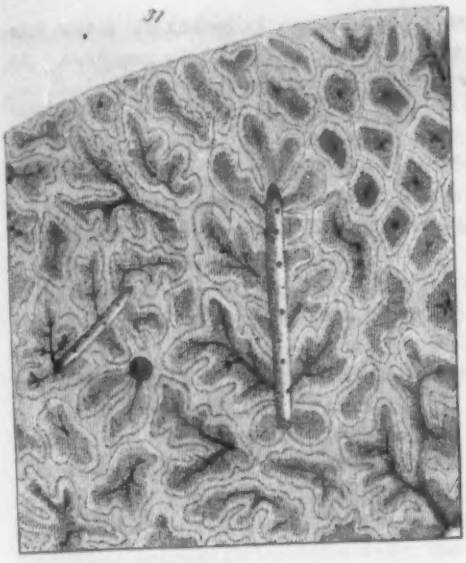
" 33, A small portion of fig. 33 more highly magnified. The secreting cells are seen within the tubes, and in the interspaces of the latter the fibrous tissue is represented.

" 34, Portion of a biliary tube, from a fresh human liver, very highly magnified. The secreting cells may be noticed to be polygonal from mutual pressure.

" 35, Three secreting cells detached.

" 36, A secreting cell much more highly magnified, representing plainly the internal

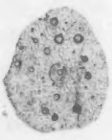
31



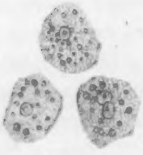
34

37

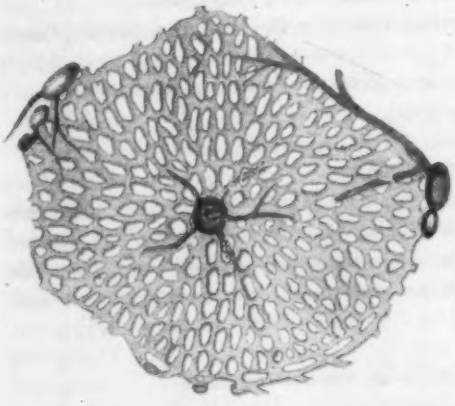
36



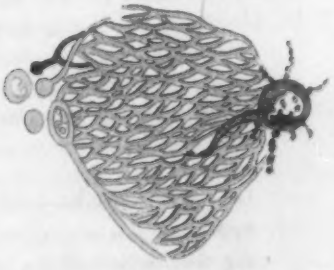
35



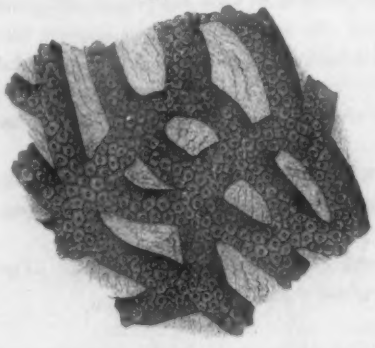
32



38



33.



39.

Joseph Leidy, M.D. del.

T. Sinclairs lith. Phil.

structure. The granular nucleus is central, and the small bodies with thick black outlines represent oil globules.

Fig. 37, Four secreting cells, from a human liver, in a diseased condition called "fatty degeneration" or "fat liver." The great increase of oil globules is observable.

" 38, Transverse section of a lobule, from the same preparation as 31 and 32, but not so highly magnified as 32, representing the relation of the three sets of blood-vessels with each other and with the biliary tubes. The artery is coloured red, the vein blue, and the vena portarum yellow.

" 39 Represents a longitudinal section, highly magnified, of a portion of a lobule, from an injected preparation, made by Dr. Horner, of the liver of a child about 6 years of age. It will be perceived there is a free anastomosis of the three sets of vessels, which have all been successfully injected with red colouring matter. Spaces are also observable through which the injection failed to pass.

ART. II.—*Of the Relative Proportions of the different Organic and Inorganic Elements of the Blood, in different Diseases.* By CHARLES FRICK, M. D., of Baltimore.

THE following analyses were undertaken with no view to support any particular theory, in regard to the chemical changes that the blood undergoes in disease; nor is it proposed, in the present article, to enter into any discussion in regard to the transformation into each other of the different organic principles, nor of the peculiar purposes that each of them is supposed to subserve. Our object, so far as we were able, has been, first, to determine a formula for the composition of healthy blood that would serve as a standard with which we might afterwards compare that obtained in different diseases; so as to note whether any changes occurred which would prove of assistance in diagnosis or treatment. Andral, it is true, had already done a great deal in ascertaining the changes of proportion that the different organic elements undergo in various diseases; but there seemed still to be an ample field in the observation of the inorganic materials, which promised fully to repay any one who should undertake its cultivation. We are sorry to say that with us, in a great measure, this has not been realized.

It cannot be doubted that when any of the varied processes of nutrition take place in an abnormal manner, the blood, from the part it performs, undergoes important changes. In their relation to what is called disease, these changes are sometimes causes, and sometimes effects; and we have confined our researches principally to that class of diseases in which it is generally supposed the change that takes place in the blood is primary. The cases have been collected during the last eighteen months, and particular attention has been paid to the diagnosis, recording only those about which there was no doubt. Thus, although more than 150 cases have been analyzed by us, yet about 80 only are here presented; the rest being

useless either from the uncertainty of the diagnosis, or the inaccuracy of the analysis.

In regard to the organic elements, both in a state of health and disease, the results that have been attained agree in almost every instance with those arrived at by Andral; while the normal proportions of lime, soda, potash, phosphoric acid and iron, are almost identical with those of Nasse and Enderlin. The notice of peculiar alterations in similar diseases we shall defer until speaking of them in detail, and in the mean time will merely state one prominent fact that has been observed in their examination collectively.

We have found that the quantity of the chlorides and phosphates of soda and potash is dependent, not upon the particular disease, but upon the season of the year in which the examination is made; and that the average for these salts is much higher during the Winter and Spring, than in the Summer and Fall. Thus, taking all the cases indiscriminately, the average for the months of November, December, January, February, March and April, is 5.146 for the chlorides, and 1.167 for the phosphates; whilst, during the months of May, June, July, August, September and October, the average is 3.759 for the chlorides, and 0.575 for the phosphates.

The following table shows the average for each month.

	Chlorides of Soda and Potass	Phosp. Sodæ and Potass.		Chlorides of Soda and Potass.	Phosp. Sodæ and Potass.
January,	5.121	1.064	July,	3.207	0.659
February,	5.196	1.074	August,	2.940	0.906
March,	5.359	1.459	September,	2.742	0.471
April,	6.565	1.103	October,	4.073	0.710
May,	4.397	1.023	November,	4.273	1.260
June,	3.914	0.635	December,	4.955	0.963

This difference, so apparent, may, perhaps, be accounted for by the increased exhalation from the skin that takes place at this period, and will easily explain how the idea became prevalent, that there was a diminution of these salts in the essential fevers. The average for the months of August and September is seen, by reference to the preceding table, to be far below that of any of the other months, and as these fevers mostly occur during the latter part of Summer and the commencement of Autumn, an examination of them, without comparison with other diseases occurring at the same period, would easily induce error.

Before giving the cases in detail, we will submit the method that has been followed in their analysis, and which has been arrived at only after laborious and repeated experiments.

The blood is first drawn into two vials, each containing about two ounces, which, by way of distinction, we shall call No. 1, and No. 2. These are allowed to stand until coagulation has taken place, and one of them, say

No. 1, is then weighed accurately: the contained blood is then poured into an evaporating dish, and dried till it ceases to lose weight. By ascertaining the weight of the empty vial, (which must be deducted from the whole amount,) and of the blood thus dried, we obtain already two of the desired results; viz., the amount of solids, and the amount of water, from which their relative proportions in 1000 parts may be easily estimated. This blood, now dried, must be put aside for incineration. We now pour off as much of the clear serum as we can from No. 2, into some small vessel, and after ascertaining the amount, dry it as before, and weigh it. The most convenient method of doing this is, after ascertaining the quantity, to pour it on a piece of paper already weighed, which absorbs readily, and then estimate the quantity of solids in the serum by drying this, and finding how much additional weight it has acquired. For instance, suppose we have poured on a piece of paper weighing 300 grains, 400 grains of serum, and find the paper, when dried, to weigh 340 grains. This 40 grains is deducted from the 400 grains of serum, and there is left 360 grains of water. Now, suppose that we have previously found in No. 1, that 1000 grains of blood contained 200 of solids and 800 of water; as all the water exists in the form of serum, the whole amount of solids of the serum, in 1000 grains of blood, will bear the same proportion to 800, as 400 does to 360. We now weigh the clot that remains in No. 2, as before, and on adding the quantity of serum poured off, obtain the whole amount of blood. We prefer pouring off the serum in the first instance, because in weighing, the change of position in the vial would be apt to render it turbid. The clot is then passed through a piece of fine muslin, and washed until the fibrin that remains becomes perfectly white, and afterwards dried and weighed. By this means the proportion of fibrin is ascertained, which, added to the solids of the serum, and deducted from the whole solids previously obtained, leaves the quantity of globules. This, we think, is an easier method than the one pursued by Andral and Gavarret, and fully as accurate.

We now come to the *inorganic* materials. In this, our attention was confined to the estimation of the principal elements only; viz., the iron, the lime, and the chlorides and phosphates of soda and potash. The blood that had been previously laid aside for incineration, is subjected to a red heat in a platinum crucible, until nothing remains but the salts, and a greater or less quantity of charcoal. This mass, after having been treated with distilled water, is filtered, until no residue remains on evaporation. The solution contains all the soluble salts. We divide it into two equal parts by means of a graduated glass, and in one precipitate the chlorides of soda and potash, with a solution of nitrate of silver, forming chloride of silver; and in the other, the phosphates of soda and potash, by adding a solution of sulphate of alumina and potassa, forming phosphate of alumina. These are collected on a filter, dried, washed and weighed. From them are easily deducted the amount of chlorides and phosphates. The mass left on the filter

in the first operation, consists principally of iron, lime, phosphoric acid and charcoal. To separate these, the first step is to get rid of the charcoal, which is done by adding a few drops of nitric acid from time to time, and then heating it; thus supplying oxygen, and converting the carbon into carbonic acid. This could not be done at any previous step, because with the chlorine nitro-muriatic acid would have been formed. After the charcoal is entirely got rid of, the whole is weighed, and thus we obtain the amount of insoluble salts. It is then treated with boiling acetic acid, which dissolves out everything but the iron and phosphoric acid, which are collected on a filter, and estimated together as peroxide and phosphate of iron. The lime is then precipitated as oxalate of lime, collected and estimated as before.

If it is wished to obtain the urea and uric acid, the blood is first boiled to coagulate the albumen, and the remaining fluid then separated by pressure. As this fluid still contains some albumen which is held in solution by a free alkali, the latter must be neutralized by acetic acid, when a further precipitation takes place on the application of heat. This is then filtered and evaporated to dryness, when the urea and uric acid are dissolved out by alcohol, and their presence tested as in urine by nitric acid.

Becquerel and Rodier, in a series of articles on the composition of the blood, published about two years since in the *Gazette Médicale de Paris*, have also detailed their method of analysis; and as we find that our results differ in one or two important particulars from theirs, we propose to show how this difference may be accounted for. In the first place the average standard of the chlorides in our cases is much more elevated than in theirs. This, we think, can be explained by the circumstance of their using a porcelain crucible during the first part of the incineration, and their applying the heat for a much longer period than was done by us; thereby much increasing the risk of volatilizing a portion of the chlorides. We find, also, that they suppose all the insoluble matter left after taking out the iron, consists of phosphate of lime; consequently their average of lime is much above ours. Now the opinion generally among chemists is, that, on incinerating lime, iron and phosphoric acid together, the phosphoric acid always unites with the iron in preference to the lime. It may be proved that such is the case in the present instance, by two facts. We have supposed the iron collected on the filter, to consist of peroxide and phosphate of iron, from this reason. In a great many of the cases we estimated the phosphoric acid, but finding its quantity so uniform, we did not carry it out in every instance. Our proceeding was as follows: after separating the salts soluble in acetic acid, we weighed the iron that remained and then dissolved it in boiling nitric acid: to this phosphate of soda was added, and the whole heated to a red heat. The soda and phosphate of soda that had not entered into combination with the iron, were then dissolved out, and the solution filtered and weighed. The remainder was phosphate of iron alone. We always found, by the difference of weight, that less phosphoric acid

was required to convert the whole into phosphate of iron, than would have been, had the whole been peroxide of iron, thereby showing that part of it was already phosphate of iron. And again, on testing the acetic solution with oxalic acid, the lime obtained very seldom amounted to the difference between the quantity of iron and of insoluble salts, as Becquerel and Rodier have assumed.

The following is the average that we have obtained from the examination of nine healthy individuals, four being females and five males. All of them were selected from the lower classes, and although well fed, were, nearly all, more or less intemperate.

Amount of solids in		1000 grs.	208·622
Do.	Water	do.	791·378
Do.	Fibrin	do.	2·952
Do.	Globules	do.	127·426
Do.	Solids of serum	do.	78·244
Do.	Perox. and phos. ferri	do.	0·582
Do.	Lime	do.	0·183
Do.	Chlor. sod. and pot.	do.	4·822
Do.	Phos. sod. and pot.	do.	0·874

We have included in our list nine cases of inflammations of various kinds. We find the fibrin elevated above its natural standard, in all but one case, amounting in one instance to **10·337**, the highest we have yet found. The exception occurred in a young man, very large and stout, who had had a slight tonsillitis for some days unattended by fever. He had been taking large quantities of bicarbonate of soda and chlorate of potash, which would account for the great excess of the chlorides, being the highest number we have yet seen. The iron, as we should have remarked before, in every case without relation to the disease, bears almost an exact proportion to the quantity of globules, and we find the average of the nine cases to be almost exactly that of health. No. 2 had lost ℥xij of blood by a previous bleeding.

Acute Inflammations.

No. of case.	Disease.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Phosphates and perox. ferri.	Lime.	Chlorides, soda, and potass.	Phosphates, soda, and potass.	Date of patients' sickness.
1	Pleurisy	199·185	800·815	3·501	121·700	73·984	·566	·252	5·385	1·378	Dec. 14
2	Pneumonia	200·331	799·669	4·954	123·377	72·000	·685	·161	3·832	·854	Dec. 29
3	Pneumonia	214·493	785·507	10·337	131·263	72·893	·598	·262	4·322	1·012	Nov. 23
4	Pneumonia	198·704	801·296	7·420	122·522	68·762	·592	·198	5·200	·975	March 1
5	Bronchitis	206·278	793·722	4·831	129·360	72·087	·573	·176	3·200	·822	June 3
6	Pleurisy	201·400	798·600	6·111	120·431	74·858	·509	·210	5·300	·654	Oct 24
7	Enteritis	208·209	791·791	5·027	120·905	82·277	·546	·184	6·158	·808	April 2
8	Enteritis	211·904	788·096	4·646	118·134	89·124	·517	·190	6·430	1·423	April 16
9	Tonsillitis	229·276	770·724	2·773	142·394	84·109	·708	·176	7·048	1·390	Jan. 28
			Average	5·511	125·343	76·677	·584	·201	5·208	1·035	

Pulmonary Tubercles.—We have examined the blood of eight persons suffering with this disease. In four the tubercles were as yet crude, while in the others they had softened and cavities had formed. In No. 5, there was a very large cavity and extensive tuberculization in both lungs; and in No. 7, a man aged 70, there was a cavity in each lung. In comparing these two classes of cases, we have found a marked difference. The average for the fibrin in the first four, in which cases the tubercles were unsoftened, is 2.776, about normal; while in the others it is 4.144. This result is similar to that obtained by Andral. The albumen in every case is above the natural standard, although not so apparently. We have carried out the proportion that it bears to the whole amount of solids, in a separate column, and the fact that such is the case will be seen by reference to it. This is also true of each one of Andral's cases, although he seems not to have noticed it; for we find the average in his to be 94.3, while in ours it is only 87.847. The difference between the two stages is also apparent, the average for the first set being 90.83, and for the other 84.35. We make the following suggestion in regard to the increase of this material.

Albumen is deposited in all the tissues as a result of secondary assimilation; and we suppose that in a tubercular diathesis the vitality is not sufficient to carry it one grade further, and change it into globules, but allows it to remain as albumen, a nucleus for the deposition of tubercular matter, or perhaps to be changed itself into it. This albumen is deposited alike in every individual, but it is only in a tubercular diathesis, or where the vitality is lowered, that it is converted into tubercle. Andral says that tubercular matter is never deposited so long as the globules remain at their proper standard, and that when this deposition first takes place, they are always found lowered; and we may add, that the albumen is always found increased. This change is probably not an evidence that they are about to be deposited, as he also thinks; but, that the albumen remains unconverted into globules, accounting for the increase of the one, and the diminution of the other.

The iron and chlorides follow the laws noticed previously; while a marked difference is perceptible in both the lime and phosphates in the two contrasted stages. In the first set, the lime in every case is above the standard, while the phosphates are below; the average for the first being 0.277, and for the other 0.272; whilst, in the other set, the average is 0.083 for the lime, and 1.265 for the phosphates. This difference in the phosphates cannot be accounted for by the season of the year, for, on making the average from the table previously given, we obtain 0.952 for the first set, and 1.202 for the second; above what is here found in the one case, and below it in the other. It may be that these salts compensate, in a measure, for one another; or, perhaps the excess of the phosphates, occurring as they do in the cases which have been some time in the hospital, may arise from the fact, that these persons are constantly taking into their systems

ammonia, of which there is always more or less, in every room where patients are collected together.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Ditto, proportionate to whole solids.	Iron.	Lime.	Chlorides of soda and potash.	Phosphates of soda and potash.	Date of sickness.
1	212·631	787·369	3·395	125·645	86·546	87·23	·564	·272	2·530	·336	Aug. 20
2	199·666	800·334	2·688	111·453	85·525	90·30	·487	·257	5·632	·197	March 22
3	200·602	799·398	2·862	117·480	80·260	84·31	·510	·296	4·822	·203	June 1
4	207·007	802·993	2·159	104·600	100·248	101·46	·416	·283	2·910	·351	Oct 1
5	169·000	831·000	5·250	94·833	68·917	85·83	·384	·052	3·992	1·616	March 3
6	198·053	801·947	4·502	117·405	76·046	80·63	·470	·182	5·500	1·462	Feb 1
7	155·000	845·000	2·352	91·456	61·192	82·94	·376	·027	3·560	1·278	Nov. 6
8	167·436	832·564	4·353	93·061	70·022	88·00	·391	·040	3·924	0·705	Nov. 23
		Average	3·145	100·604	76·844	87·84	·449	·179	3.722	·775	

Remittent and Intermittent Fever.—In the following table, the first five cases are of remittent, and the remainder of intermittent fever. Two are of the congestive form, one remittent, No. 1, and the other intermittent, No. 7. In studying the proportion of fibrin in these cases, it will be found that, in four of those classed as remittent fever, this element is above the average standard, the exception occurring in a patient, the duration of whose disease had been three weeks, and in whom all the elements of the blood, except the chlorides and the phosphates, were below their natural standard: while in five of the cases of intermittent fever out of seven, it is below the average quantity; No. 10, one of the exceptions, being complicated with ascites, and œdema of the lower extremities, coming on as an acute affection, and being preceded by a chill; and the other being complicated with a pneumonia at the summit of the lung. It has been suggested, that the difference between these two fevers consists in the first having an acute gastro-duodenitis superadded to the second, thereby producing the gastric symptoms, so common to the one, and wholly wanting in the other, and also accounting for the attendant fever, being of a continued type. The increase of the fibrin in these cases seems, in a measure, to substantiate this idea. The globules in the remittent form, in all the cases except the one above alluded to, are increased, as is the case generally with all the pyrexiæ. The changes of quantity in the chlorides and phosphates are found to be nearly dependent upon the particular month in which the examination is made; and instead of being diminished, as Stevens has asserted, are, in reality, somewhat above the average in a majority of the cases, viz., nine out of twelve.

No. of case.	Duration of disease.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides of soda and potash.	Phosphates of soda and potash.	Date of sickness.
1	2d day	211·780	788·220	3·456	128·232	79·920	·592	·179	4·424	·580	Oct. 10
2	5th day	217·063	782·937	3·814	138·546	74·707	·785	·164	5·380	1·012	Dec. 12
3	1st week	208·250	791·750	3·605	131·916	73·429	·627	·152	3·982	·562	Aug. 1
4	10th day	233·500	766·500	3·260	137·740	92·500	·762	·223	5·093	·923	Oct. 29
5	3d week	146·022	853·978	2·213	90·306	52·903	·416	·054	4·928	·778	Dec. 4
6	16th day	176·568	823·432	2·000	97·380	77·188	·423	·083	5·582	1·322	Oct. 31
7	1st day	205·310	794·690	1·777	122·301	82·766	·524	·223	3·449	·602	Aug. 6
8		197·015	802·985	2·324	124·526	70·165	·595	·083	5·332	1·743	Aug. 24
9		201·059	798·941	2·656	125·711	72·692	·613	·296	4·356	·208	Nov. 12
10		175·338	824·662	6·250	97·222	71·866	·446	·192	3·600	1·711	Nov. 24
11	2d day	207·347	792·653	3·057	129·772	74·518	·588	·197	6·396	1·261	Dec. 12
12	6 weeks	186·192	813·808	4·194	112·756	69·242	·569	·169	4·828	·335	Jan. 3
			Average		118·484	72.447	·580	·165	4·797	·938	

Typhoid Fever.—On an examination of the following analyses of the blood in Typhoid Fever, it will be found that, as far as related to the organic elements, they are in accordance with those made by Andral. There is a diminution of the fibrin in six of the ten cases, and we find that the globules are either in the normal proportion, or elevated above it in seven. The average for the lime is below what is found in a state of health, and this is true of every individual case with the exception of No. 3. The proportion of chlorides undergoes a slight diminution in almost every case, but scarcely enough to be of importance.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides of soda and potash.	Phosphates of soda and potash.	Date of sickness.
1	203·000	797·000	2·860	128·432	61·708	·590	·133	3·720	·893	Jan. 3
2	198·994	801·006	2·320	124·322	72·252	·586	·142	3·660	·762	May 3
3	177·520	822·480	1·978	107·265	68·277	·427	·182	2·886	·443	Aug. 16
4	191·084	808·916	2·884	121·924	66·276	·488	·125	3·094	·672	Aug. 10
5	217·890	782·110	2·290	132·970	82·630	·742	·120	2·864	·495	Oct. 10
6	207·200	792·800	1·886	127·314	78·000	·525	·177	2·520	·022	Oct 20
7	208·426	791·574	4·094	126·036	78·883	·556	·156	2·940	·906	July 10
8	217·063	782·937	3·814	138·546	74·704	·785	·164	5·380	2·012	Dec 12
9	193·333	806·667	3·333	116·025	73·975	·597	·159	4·532	·390	Jan. 26
10	212·365	787·635	3·346	141·476	67·543	·620	·121	3·720	·722	May 21
		Average	3·087	133·117	70·259	·604	·136	3·611	·706	

Typhus Fever.—The cases of Typhus Fever that are here presented, were all, except No. 7, taken from among the Irish emigrants who arrived in this country last spring. The fibrin, we see, is below its normal proportion, and the globules are increased in six of the seven cases. The exception No. 2, in whom we found this last element diminished to 116·224, had been sick for three weeks, and was very much emaciated. The average for the other six cases is 143·912 higher than we have found for the same number of cases in any other disease, not even excepting cerebral congestion, or apoplexy. The proportion of lime is diminished in five

cases, while in No. 3, it attains a higher elevation than we have observed in any other instance, viz., ·362. The chlorides, as we have also seen previously in Remittent Fever, are, in a majority of the cases, somewhat elevated above their proper standard; while the phosphates are diminished. The blood of the first four of those cases was examined for urea and uric acid, and an analysis of the urine of all was made, except the last. We found urea, and uric acid, in very small quantities, in Nos. 3 and 4, the two cases in which the lime is so greatly in excess; while in the two others, no trace of either was discoverable. In the urine of all, these same principles were either normal, or much diminished. In No. 3 and No. 5, they were normal, while in No. 1, no trace of either was perceptible. And again, in No. 1 and No. 5, where the phosphates are so much in excess in the blood, the urine scarcely contained any; while in No. 6, where they are diminished almost a third in the blood, they were found in great abundance in the urine.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides of soda and potash.	Phosphates of soda and potash.	Date of sickness.
1	241·479	758·521	3·060	153·218	85·194	·630	·119	4·052	3·158	May 12
2	204·096	795·904	1·351	116·224	86·521	·529	·161	4·592	·826	May 14
3	226·300	773·700	1·046	140·297	84·957	·654	·362	4·924	·628	May 16
4	203·849	796·151	2·238	141·131	60·480	·650	·220	5·000	·580	May 18
5	214·612	785·388	3·315	140·647	70·650	·628	·071	5·316	1·176	May 19
6	215·517	784·483	2·968	141·061	71·488	·660	·118	3·976	·317	May 23
7	229·860	770·140	2·322	146·096	81·439	·683	·100	4·084	·653	August 4
		Average	2·329	131·231	80·103	·633	·165	4·549	1·048	

Albuminuria.—Three of these cases were chronic, well marked, and of some years' duration; the other, No. 3, was a large, stout black man, who, after a chill, was seized with pain in his loins and suppression of urine, followed, in a few days, by ascites and œdema. In this state he entered the Infirmary, and, after some weeks, went out cured. His urine was loaded with albumen, and, on an examination of the blood, after coagulation, the serum, instead of being clear, was found to resemble very nearly thick cream. This appearance was undoubtedly owing to the presence of undissolved albumen; and we at first supposed that this element was in a quantity too large to be entirely taken up by the water. But the analysis shows this reason to be incorrect, for the proportion of albumen is in reality below the normal quantity. We find, however, in this patient, a considerable quantity of urea, and uric acid, particularly the last. Now this albumen could only remain undissolved from the presence, in the blood, of some free acid. May not the lithic acid, here found, have exerted that effect?*

* We find, in a case analyzed by Simon, that there was the same peculiar appearance of the serum, as we observed in this patient. He concludes that it was fibrin

Urea, and uric acid, were also found in No. 4, but in very small quantity; the other cases were not examined. In all, the urine was coagulable by heat and nitric acid. We are far from thinking the case detailed above, to be one of granular degenerescence, and, in fact, it should not have been placed in the table. It resembles, rather, those cases of dropsy that are seen to occur after scarlatina, where granular degenerescence has not yet taken place. In speaking of phthisis, we attempted to account for the excess of albumen in the blood; we would suggest the following explanation of its deficiency in that fluid.

From a want of sufficient vitality of the system in the transformation of the tissues, the albumen, instead of being changed into urea and lithic acid, passes into the kidneys as albumen. This they at first refuse to excrete, but, finally, when all the tissues are filled and clogged with it, the kidneys commence to pass off the superfluous quantity; and, having done so, they can afterwards only excrete albumen, which they do by taking it in an increased proportion from the blood, thereby accounting for its deficiency in that fluid. This albumen, undergoing a species of transformation called granular, fills up the cortical portion of the kidney, and renders it unfit for the proper performance of its functions.

In each of these cases, the fibrin was found to be much increased; and the solids of the serum, consisting of albumen principally, a good deal diminished; the average for the first being 5·396, and for the other, 65·400. In three cases of this disease, examined by Andral, the fibrin in all was found to be diminished; while in four analyzed by Franz Simon, this element was above the normal quantity. The lime in all is below the healthy standard; excluding No. 3, the case previously spoken of, the average for this salt is 0·078, less than one-half. The chlorides, phosphates, and iron, undergo no change peculiar to the disease.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides of potash and soda.	Phosphates of potash and soda.	Date of sickness.
1	143·819	856·181	4·474	81 509	57·645	·418	·0·2	2·422	·630	August 3
2	207·000	793·000	7·622	126·949	72·468	·571	·078	2·591	·593	Sept. 10
3	194·925	805·875	6·053	118·671	70·201	·515	·148	6·270	·292	Dec. 31
4	182·402	817·598	3·845	117·207	61·350	·530	·085	5·176	·785	Feb. 24
		Average	5·396	111·599	65·400	·509	·098	4·114	·567	

Purpura Hæmorrhagica.—With the three cases that we have classed as purpura, we have included one of scurvy, viz., No. 2. This patient had just arrived from shipboard, after a long passage of three months, and had

from the effect, upon it, of chemical reagents. But, as we do not yet know the essential difference between fibrin and albumen, it is impossible to pronounce with any certainty about it.

lived entirely on salt provisions. His gums were soft, swollen, and bleeding; and he had had one or two slight epistaxes. He complained of a sense of heaviness in his head, and on his body were numerous petechiæ. But finding the changes in his blood to resemble, in a great measure, the other two cases, we have considered them all together. The first case was a man who entered the hospital with a fractured condyle, very anemic, and with a "*bruit de souffle*" in his carotids. A few days after his entrance, purpura made its appearance about the seat of injury, and extended in patches in both directions. He was bled on the third day of its occurrence. In No. 3, these patches appeared in a patient, who had been suffering with intermittent fever for two weeks. Let us now look at the condition of the blood in these cases. In two, the fibrin is increased one-third; while in the other it is very little below its normal quantity; and we must not forget, in this last case, that the man already had intermittent fever, which would, by itself, predispose him to have a diminution of the fibrin. This result is not in accordance with the conclusion arrived at by Andral in this disease, who considers purpura as a kind of hemorrhage, and where the fibrin must of necessity undergo a diminution. The blood, in these cases, had not the peculiar dissolved appearance usually described; for in each, the clot and the serum were found to be perfectly separable. It is true that, in the first of these cases, there was most probably inflammation set up around the fracture, and, as a consequence, an increase of fibrin: but this, if the other rule holds good, would, *per se*, prevent the occurrence of purpura. In four cases of scurvy, recorded by Franz Simon, the average for the fibrin was 5·04; while in one of purpura, he found it to be only 0·905. The globules, we see, are diminished in each individual case, making the average considerably below that of health.

We have found, in this disease, more alteration in the inorganic elements than in any other that has fallen under our observation. We have carried out, in a separate column, the proportion that the iron bears to 127 parts of globules, and it will be seen by this, that in each case this principle is greatly above the normal quantity, the average being nearly one-half more. The chlorides and phosphates are also increased, as was found to be the case in typhus and remittent fevers; while the lime is diminished to less than one-half, the average being 0·082. We will not bring forward any theoretical notions, by way of accounting for these alterations of quantity; partly, because the cases are too few in number to enable us to say that they are constant changes; and partly, because we think if they are facts, they will speak for themselves.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Proportion of iron to 127 parts of globules.	Lime.	Chlorides.	Phosphates.	Date of sickness.
1	155·771	8 4 229	4 047	82·276	69·448	·467	·723	053	5 544	3 088	March 22
2	208·327	791 673	4 204	117·078	87·045	·721	·782	·110	6 ·46	1·126	April 12
3	197·015	802 985	2 324	124·521	70 165	·195	903	·083	5 332	1 743	November 24
		Average	3·518	107 960	75·553	·694	·813	·082	5·907	1 986	

Acute Articular Rheumatism.—In the following table, No. 1 and No. 4 were patients in whom the disease was slight; No. 3, one in whom the duration had been six days, and where the disease was seated in one knee and ankle; and No. 2, another whose articulations were all more or less involved. He had been sick three weeks, and had been taking for four days large doses of phosphate of ammonia, which will account for the great excess of this salt in his blood. We could find no trace in that fluid, of either urea, or uric acid. The urine was examined in Nos. 2 and 3; in each there was a great excess of urea, with deficiency of lithic acid. It was also loaded in both cases, to an extreme degree, with lactate of soda, and in the last the phosphates, both earthy and alkaline, abounded.

The blood in this disease presents the same alterations that are found in ordinary inflammations, viz., an increase of the fibrin, and a slight diminution of the globules; we shall therefore submit these cases without additional remarks.

No of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime	Chlorides.	Phosphates.	Date of sickness.
1	208 209	791 791	5·027	120 905	82·277	·546	184	6 158	·808	April 2
2	211 111	788·889	8 318	103 241	99 552	·486	·153	3 277	3 298	January 31
3	194 952	805·048	6 722	122·162	66 068	555	·151	4·200	·644	Feb. 10
4	211·904	788 096	4 646	118 134	·9·124	·524	·190	6 430	1·423	March 3
		Average	6·178	116·110	84·230	·525	·169	5 016	1·222	

Acute Dropsy.—The three cases of dropsy here presented, all occurred after intermittent and remittent fever, and in the first was preceded by a chill. We find the fibrin increased in two, and the globules diminished in all; this latter we would be led to expect, from the fact of the disease having always lasted some time before the supervention of the dropsy; but whether this diminution has any effect in the production of the latter, it is impossible to say.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides.	Phosphates.	Date of sickness.
1	175·383	824·662	6·250	97·222	71·866	446	·192	3·600	1·711	Nov. 23
2	198·730	801·270	2·3·7	93·874	92·509	·476	·181	2·340	·680	August 6
3	200·622	799·378	3·202	114·819	88·609	·504	·200	4·001	1·010	Dec. 21
		Average	3·613	103·291	84·325	475	·191	3·313	1·134	

Anæmia.—All these cases of anæmia occurred after intermittent and remittent fever, and in all the duration of the disease was more than one year. None were complicated with dropsy; but No. 1, who had been in this condition, from her own account, for more than three years, and whose mucous membranes were perfectly white, was seven and a half months advanced in pregnancy. The lime, it will be seen, is far above the normal quantity, as are also the chlorides and phosphates. The increase in these elements is, however, not absolute; for, if we take into consideration the increased quantity of the serum, and the remarkable diminution of the globules, we will find that the relative proportions of these salts to the whole amount of solids, remain unchanged. Becquerel and Rodier suppose that this excess of lime in anæmic patients, is partly owing to its non-assimilation by the bones, and partly to its resorption from these organs. But this explanation seems to us entirely gratuitous, for we do not find that the bones of anæmic patients are more deficient in this principle than any others.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides.	Phosphates.	Date of sickness.
1	89·552	910·448	3·854	14 757	70 941	·068	·372	6 222	1 209	January 4
2	116 000	884·000	2 565	31 628	76·807	·143	·283	5·535	1·765	Nov. 26
3	113 870	886·130	2·876	35 673	75·321	·190	·321	4·326	1 102	October 6
4	84 090	915 910	2·034	29 836	52 130	·185	·100	3 608	·443	October 25
		Average	2·832	27 971	68·799	·146	·269	4·942	1 104	

Pregnancy.—The cases of pregnancy here detailed, are all in the advanced stages. The first was a woman æt. 34, large, stout, and eight months and a half advanced; the second, æt. 32, was in the eighth month; the third is the same case as No. 1 of the preceding table; and the last was advanced to the seventh month. The lime, the chlorides, and the phosphates, are increased as in the preceding set, and most probably for the same reason.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides.	Phosphates.	Date of sickness.
1	199·671	800·329	4·062	115·239	79·270	·528	·254	4·232	1·213	Nov. 28
2	197·368	802·632	4·902	113·609	78·857	·531	·126	7·236	1·449	April 22
3	89·552	910·448	3·854	14·757	70·941	·068	·372	6·222	1·209	January 4
4	201·672	798·328	3·922	120·320	77·430	·589	·198	3·721	·982	June 21
		Average	4·185	90·981	76·624	·429	·237	5·352	1·213	

Small-Pox.—The first of these cases was complicated with a pneumonia, was of the confluent form, and the blood was drawn on the tenth day after the appearance of the eruption. The other was of the discrete form, and was bled on the seventh day of the eruption. Both were blacks.

No. of case.	Solids in 1000 grains.	Water in 1000 grains.	Fibrin.	Globules.	Solids of the serum.	Iron.	Lime.	Chlorides.	Phosphates.	Date of sickness.
1	211·883	788·117	5·665	122·125	83·593	·572	·052	1·970	·271	August 14
2	208·320	791·780	2·280	129·362	76·678	·600	·131	2·893	·380	Sept. 14
		Average	3·972	125·743	80·135	·586	·091	2·431	·325	

Recapitulation.—In summing up the results which may be deduced from these analyses, we will consider the different elements separately, and first:

The Fibrin.—Our results in regard to this element agree entirely with the conclusions arrived at by Andral and Gavarret, in all the diseases that have fallen under our observation, with the exception of albuminuria and purpura. Those of Simon in the first of these, are in accordance with ours.

Globules.—In the same diseases, the changes in quantity of this material are similar to those of Andral. In remittent and typhus fever, we have found, that they follow, in a majority of cases, the laws laid down for the pyrexiæ.

Solids of the Serum.—These, so far as we have observed, are in accordance with the results previously obtained by other observers.

Iron.—In all cases, this salt is found to be in proportion to the quantity of globules, except in purpura, as detailed previously.

Lime.—This element we found to be more variable than any of the others. It was increased in inflammations, acute dropsy, pregnancy, anæmia, and phthisis, where the tubercles were not yet softened; it was diminished in purpura hæmorrhagica, albuminuria, small-pox, and phthisis, where softening had taken place; and it remained about its proper standard in acute rheumatism, remittent typhus, and typhoid fevers.

Chlorides of Soda and Potash.—The quantity of these is found, as previously stated, to depend almost entirely upon the particular month in which the patient is bled. In purpura, however, they are much increased, nearly one-fourth; and also slightly, in typhus and remittent fevers.

Phosphates of Soda and Potash.—The changes in these are nearly identical with those of the chlorides, excepting in phthisis. In this disease they are deficient, where the tubercles are crude, and in excess where they have undergone softening.

These analyses have been confined to those inorganic elements only, which existed in a quantity large enough to be estimated with considerable accuracy; and it may be that the salts which have not been considered at all, are the ones which undergo the most important changes: but these principles are so minute in quantity, that it would be almost impossible to estimate them with any degree of accuracy. It may be, that, in different diseases, new principles become developed, which have heretofore escaped our observation; and this has been suggested to us by the fact, that, in estimating the inorganic elements of the blood, we have been frequently struck with the difference of quantity in the amount of the insoluble salts. For instance, in a state of health, the whole insoluble material is found to be just equal to the amount of iron, lime, and phosphoric acid; in acute inflammations the average excess of this insoluble matter over these salts, is ·120; in remittent fever, ·350; in typhoid fever, ·360; in typhus fever, ·378; in albuminuria, ·378; and in purpura, ·495. These materials certainly exert some influence over the peculiar conditions with which they are identical, and we suppose them to be new principles, from the fact that they are only found in specimens of diseased blood.

It has often happened, that two different kinds of blood have fallen under observation at the same time; where the same quantity has been selected, the same process used, and nearly the same results obtained for each. And yet the appearance that the separate principles presented, was very different: in one the albumen would be perfectly white, and in the other, a distinct straw colour; still, so far as we could learn, they were both albumen. And again, on setting aside two equal quantities of blood, the one from typhus, and the other from typhoid, fever, the latter would remain for some days, separate as clot and serum, while the other, in the course of a few hours, had become a diffluent mass, and yet the analysis of those two was found to be nearly the same. We are forced by facts like these, to conclude that ultimate chemistry plays a most important part in the production of disease; and in unravelling the tangled web of pathological hæmatology hereafter, its assistance must principally be relied upon.

In conclusion, we beg leave to return our thanks to Drs. Power and Buckler, and the Resident Physicians of the Baltimore Alms House, for their kindness in furnishing us most of the specimens of blood, whose analysis is herein contained.

Baltimore, Oct. 20, 1847.

ART. III.—*Report on Scorbutus, as it appeared on board the United States Squadron, Blockading the Ports in the Gulf of Mexico, in the Summer of* 1846. By J. M. FOLTZ, M.D., Surgeon U. S. S. Raritan, Late Fleet Surgeon, Brazil Station. [Transmitted to the Bureau of Medicine and Surgery, and communicated to this Journal by THOMAS HARRIS, M. D., Chief Bureau Med. and Surg., U. S. N.]

SCURVY occurred in a most aggravated form, on board a large portion of the squadron blockading the coast of Mexico, during the summer of 1846, and for some months disabled several of the largest and most efficient ships, at a time when their services were required to operate against the enemy. The frigates Raritan and Potomac, corvettes Falmouth and John Adams, the Flirt and the steamer Mississippi, suffered severely, and a few milder cases occurred on board most of the other ships. The disease assumed the most formidable aspect, and prostrated the greatest number of men on board the frigate Raritan and the corvette Falmouth. On board the Potomac, of fifty guns, with a complement of 500, officers and crew, recently placed in commission, and commanded by one of our most energetic and indefatigable officers, the disease appeared in August, assuming so severe a form, that she was compelled to proceed to Pensacola with more than 100 cases upon her sick report, and with symptoms of the disease in most of the crew who still continued to perform their duty. After remaining two months in port, the disease had so far diminished as to enable her to return to her cruizing station off Vera Cruz, where, by a supply of fresh provisions, the crew were restored to good health. The Potomac had a new crew, had recently been in dock—thoroughly cleansed and coppered, and for internal police and cleanliness, was unsurpassed by any ship in the service; yet the scurvy early made its appearance in this vessel, and spread rapidly. The cause of the disease can be clearly traced, and will be pointed out in the proper place.

The Falmouth had been commissioned two years, and had passed this time in the Gulf, and among the West India islands. This ship is well ventilated, and her crew enjoyed good health until invaded by the scurvy. Their long sojourn in an intertropical clime, had prepared them for the reception of the disease, and, like the crew of the Raritan, who had suffered by a similar enervation, when scurvy once occurred, it spread rapidly and was malignant in character. The Falmouth was ordered from Pensacola to Boston, as her crew were completely prostrated, and during her passage round, her only surviving medical officer, Dr. Nelson, represents the condition of the sick and dying as most deplorable. The crowded state of the sick cots and hammocks, the fetor from the ulcers, and the distress of the dying, all contributed to accelerate the course of the disease in those who were already down, as well as to induce it in the few who were still able to perform a small portion of the necessary duty.

The Mississippi steam frigate had been but little at sea. She had been eighteen months in commission: by using steam, her passages at sea were short, and in our protracted and vexatious negotiations with Mexico, during the rejected mission of Mr. Slidell, she was used as a dispatch vessel, making her passages between Pensacola and Vera Cruz in from four to six days, and passing four-fifths of her time in port, where she was abundantly supplied with fresh provisions and vegetables. Yet here the cause, we

think, can be clearly and satisfactorily traced. The number of cases was limited on board the Mississippi, and was confined to the commencement of the present war.

The frigate Raritan, of fifty guns, had the greatest number of cases, and was the longest time placed "*hors de combat*" by the scurvy. We served on that ship for more than three years, treated all the cases, and it is to the rise, progress and character of the scurvy, as it appeared on board that ship particularly, and incidentally in the squadron, which we propose briefly to investigate, confining our observations to the bounds of "a report."

The frigate Raritan was placed in commission for the first time, on the 15th November, 1843. Although a new ship in commission, she had been twenty-one years on the stocks; her model was considered one of the most perfect; which opinion her subsequent sailing qualities confirmed. But her internal arrangements, with the accommodations for officers and crew, were all of the very worst character. The hold is exceedingly small, badly arranged, and imperfectly ventilated. The berth-deck is low, with very small air-ports, arranged on the old principle, only allowing to be opened in port, when at anchor, and in the best weather, with small, dark and contracted apartments for the gun-room and warrant officers.

The hatches leading to this deck are small, and so arranged that windsails cannot pass in a perpendicular line from the spar-deck to the berth-deck or hold. The ventilation is therefore very imperfect, and those who are compelled to pass much of their time below, are deprived of light and air.

The sick-bay in the bows of the ship on the berth-deck, and the cockpit, where a mess of officers were living between the tropics, where the thermometer seldom fell to 80°, were both without light and air; apartments which, above all others in the ship, should be abundantly supplied with both. The wardroom was low, dark and dismal, crowded by a mess of fourteen, and lighted by a hatch four feet by three.

We reported for duty before the ship was placed in commission. Upon examination we found that the sick bay was very small, and without a hatch even for the admission of a windsail. The following report was made to the captain, requesting the removal of the sick-bay bulkhead aft, so as to enlarge the bay, and admit light and air into the apartment designed for the use of the sick, which were so essential to their comfort and recovery.

U. S. S. Raritan, 21*st. Nov.*, 1843.

Sir:—The crew of this ship have recently suffered much from pulmonary inflammation, incidental to the season, and in several of them the disease has assumed a most aggravated form. Thirty-one are at this time upon the sick report, and at the Hospital. I am convinced that the severity of the disease in some cases, is owing to the unusually contracted and small space allotted for the sick-bay. In all other frigates, the sick-bay bulkhead is abaft the scuttle for the fore passage. On board this ship it is forward, which not only allows a space quite too small for the sick, but precludes the possibility of admission of light or air.

I would therefore report, as necessary for the health of the ship, and to accelerate the recovery of those who may be ill, *that the bulkhead of the sick-bay be removed abaft the fore scuttle.*

I am, very respectfully, yours, &c.

J. M. Foltz, Surgeon U. S. N.

Captain F. H. Gregory, Commanding U. S. S. Raritan.

This report was transmitted to the proper authority, and the request for an alteration denied, on the grounds that it was unnecessary, and that the present arrangements are good.

On the 30th November, 1843, the Raritan left the Navy Yard at Philadelphia for New York, the ice in the Delaware rendering her departure necessary. There were but 150 officers and men on board. Six days were passed before we reached the Capes of the Delaware; off New York we encountered severe northwesters, with snow and sleet, and we did not reach the Navy Yard at New York before the fifteenth day. The weather was extremely cold during the passage, and when we reached the Navy Yard, the thermometer was down to zero. A bridge of ice soon bound us to both shores. The winter of 1843 and '44 is remembered as one of our coldest seasons, and for a long time after our arrival we were without fires.

Exposure of the crew to the severe cold, and the necessary labor of fitting out ship, kept the number of sick large. Pneumonia and fever of a typhoid type were the prevailing diseases; and all efforts to procure stoves for the ship proved unavailing, until Captain Gregory wrote to the Department, that, "unless stoves were speedily furnished, it would cost the Government more for coffins than for stoves and fuel!" The return mail brought orders to have the ship warmed.

Small-pox made its appearance about this time, and these cases, together with those down with typhus, all exhibited the influence of the vitiated condition of the air on the lower decks of the Raritan, and many of the cases of fever were so bad, that Dr. Ruschenberger, the Surgeon of the Hospital, was apprehensive of its assuming the form of an epidemic; generating in the vitiated atmosphere on the crowded, confined, and imperfectly ventilated decks of the ship.

On the 20th February, 1844, we sailed from New York for Rio de Janeiro. A few days carried us into the Gulf Stream, and in three weeks, we were near the Cape de Verd Islands, where we enjoyed warm sun, pleasant weather, and soft breezes.

How much suffering and disease, and how many valuable lives could be spared, if our ships of war were fitted out in the autumn or spring, instead of midwinter! or, should it be necessary, in time of war, to place our ships in commission in winter, humanity would at least demand that they should be fitted out in a southern port. At Norfolk, our winters are never long or severe; but north of that, ice and cold, and hard labour, have destroyed the life of many a sailor who was proud to serve under his country's flag, and to do the state service; who, labouring in the merchant service, at the same season, would have remained in health and vigour. When a merchant ship is alongside dock, her sailors are near warm rooms and comfortable fires. On board our ships of war it is not so. Cold, damp ships, kept wet in winter, to be kept clean! are the home, night and day for weeks and months, of the sailor. Spirit, which is now abolished from the merchant service, is given to keep him warm, and fuel is thus thrown into the flames which are sure to destroy him. After sixteen years' experience in the navy, during which I have served in all climates and upon all stations, I can say that I know of no means calculated to do so much good to the sailor, both morally and physically, as *the entire abolition of the spirit-ration in the navy.* A large mass of sailors, habitual drunkards, and most of them foreigners, are now to be found on board our ships of war, who come there solely because they are unable to procure their lot of grog on board merchant ships. Intemperance, agreeably to my experience, has increased, instead of diminished, in the navy, from the cause mentioned above. It is to be hoped that early legislation will correct this evil.

Intertropical temperature, repose of some months in the harbour of Rio

de Janeiro, and bringing the ship, her crew and officers, into the discipline, order, and regularity which characterize a ship of war on her station, restored the ship to a most perfect state of health. This continued uninterruptedly so long as we remained on the South American station. The average number upon the daily sick report for two years, did not exceed nine, and frequently for weeks together, ranged as low as five. The Raritan visited Bahia and St. Catharine's, and passed many months at Monte Video, at which place the seeds of the disease were sown which we have at present under consideration.

Monte Video had been under a siege of the combined Argentine and Oriental troops, under the command of Ex-President Oribe, while Admiral Brown kept up the blockade at sea, with the Argentine squadron. This siege and blockade deprived the town of almost all necessaries of life; and meats and vegetables could only be procured with the greatest difficulty, and in the smallest quantities, for the foreign ships of war; of which a large number were present, observing the progress of the war.

In July, the combined English and French fleets took possession of the Argentine squadron, established a vigorous blockade of Buenos Ayres, and prohibited all intercourse with the army of Oribe investing the city, from whom the limited supplies, previously furnished to the ships, were procured.

The Raritan, during her last two visits to the Rio de La Plata, was compelled to subsist all hands upon the salt rations exclusively. This subsisting upon salt provisions continued uninterruptedly from the time of leaving Rio Janeiro until our return to that port; nor was this living confined to salt provisions alone, but was accompanied, at times, by the use of the water of the river, taken from alongside the ship; which, notwithstanding it was freshened by violent pamperos, yet contained some saline matter. The quality of the water was not only impaired, but the quantity was at times reduced. On the occasion of these visits, the exigencies of the service were such, that the ship could not return to Rio, where the public depot of stores is kept, to replenish; and many of the most essential articles in the government ration were exhausted; and bad beef, bad bread, and bad water, the latter in limited quantities, were the provisions on which both officers and men were compelled to subsist.

The number of sick augmented monthly from these causes, combined with the enervating effects of a hot climate. There are but few places in the world where the thermometer has a higher range throughout the year than in Rio—and nowhere are the summer months (December, January, and February), more oppressive. From the records of twenty years' observations, the mean annual temperature is 79°, that of the summer, 86°.

The imperfectly ventilated condition of the lower decks during this protracted hot weather, with the vitiated condition of the atmosphere, induced by the bilge water and crowded decks, contributed to augment the tendency to disease induced by salt food.

Recommendations were sent in, to enlarge the wardroom-hatch, so as to admit light and air. Our minister at Rio Janeiro, Mr. Wise, who has in all positions taken so active an interest in the prosperity and condition of the Navy, was so forcibly struck with the imperfect arrangements on board the Raritan, and of the oppressive condition of the air on her lower decks, that he, unsolicited, used his personal influence with the Commodore to have these hatches enlarged. The following is a copy of our recommendations for this alteration:

U. S. S. Raritan, Rio de Janeiro, Oct. 8th, 1844.

Sir:—We, the undersigned, Wardroom Officers of the ship, respectfully ask to call your attention to the condition of the wardroom of this ship.

This apartment, in which thirteen officers and their servants are obliged to live, is almost entirely without light and air, and at sea, when the air-ports are caulked in, is almost uninhabitable.

The only hatch to the wardroom is covered by the spar deck, and is but four feet one inch in length, and three feet wide. We are under the necessity of using candles at all our meals, and we at all times suffer from want of ventilation.

The warm weather now approaching, will render this apartment insupportable. We therefore respectfully, but urgently, request, that you will be pleased to have the present hatch extended to the hatch leading into the steerage, which would give us light and air.

We are, respectfully, &c.
(Signed by all the Wardroom Officers.)

To Com. Daniel Turner, Commanding U. S. Squadron, Brazil Station.

U. S. S. Raritan, Rio Janeiro, Oct. 8th, 1844.

Sir:—I respectfully recommend the above alteration, as necessary to the preservation of the health of the officers and crew of this ship.

I am, respectfully, &c.
J. M. Foltz, Surgeon of the Fleet.

Com. Daniel Turner, Commanding U. S. Squadron, Brazil Station.

Commodore Turner was fully convinced of the importance of this change, and was most desirous to have it effected; but the orders from Washington, upon the subject of any alterations in the interior of ships, are so stringent, that he was unable, without a direct disobedience of orders, to carry his own and our wishes into execution.

These inconveniences were all submitted to with the utmost cheerfulness. Officers and crew combined to make a "jolly cruize," and few men in life pine less over cares, inconveniences, and misfortunes, than those whose life is passed upon the deep.

The Raritan had been fitted out for a two years' cruize, that being the time limited by the Department; and these two years had now nearly terminated.

On the 3d of February, 1846, we sailed for home, via the West Indies, with the sick and invalids of the outward bound East India and Pacific squadrons, on board; and, after a monotonous and tedious passage of 43 days, we reached Pensacola, where the sick were transferred to the hospital. The number of sick, during the passage home, was large, notwithstanding the cheerfulness of the crew. All on board were predisposed to disease, by the two years' confinement to the ship and hot weather we had just gone through.

At Pensacola, light hearts and smiling faces were changed by bitter disappointment.

The Raritan was ordered, with all possible dispatch, to proceed to Vera Cruz, in consequence of our difficulties with Mexico. In a few days, Captain Gregory reported to Commodore Conner, and we now constituted part of his squadron.

There was no intercourse with the town, and all hands were again restricted to the use of salt provisions. The crews of the squadron were frequently exercised at their guns, and the crew of the Raritan, who were perfect at their quarters, and made so by much practice, were kept as long at their labour in the hottest weather as the crews of ships recently placed in commission, and who had much to learn.

May 4th, the squadron sailed to render assistance to General Taylor, who, the Commodore had learned, would be attacked by the Mexicans. We reached Point Isabel at daylight on the 8th, and immediately proceeded to land seamen and marines to assist in the defence of the place. In four days the force re-embarked, the enemy having retreated with precipitation after their disastrous defeats on the 8th and 9th. On the 17th May, the Raritan sailed for Vera Cruz, with orders to enforce a strict and vigorous blockade upon all the Mexican ports, as far south as Alvarado. These orders were enforced, until the Raritan was compelled, by the prostration of so many of her crew with the scurvy as to disable her, to proceed to Pensacola.

During the month of April, a large number of the crew were admitted upon the list with rheumatism, the pains being chiefly confined to the lower extremities. After some days, the subjects of these cases became affected with swollen and bleeding gums, great fetor of the breath, and maculæ and the purpura scorbuticæ,which were not confined to the extremities, but also invaded, from the commencement, the body and face. These symptoms at once revealed the true character of the disease, and we found that scorbutus had seized upon us, in a form unknown in our national marine since our last war with Great Britain.

The increase in the number of cases was very rapid, from eight to ten new ones being daily admitted on the sick report; and by the 1st of June, sixty cases had been under treatment. A liberal use of the acids on board ship, with a small supply of fruits, procured through the kindness of the British and French squadrons, speedily gave relief to the patients under treatment; but the new cases daily presenting, kept up the number of sick, and gave the disagreeable assurance that the whole crew were contaminated; and that nothing but a liberal supply of fresh provisions could avert the evil.

During the month of June, nearly one hundred new cases reported for treatment, while most of those who were first seized, and were temporarily relieved by treatment, returned again to the sick bay with a new class of symptoms, presenting the disease in a more aggravated form than it had first assumed.

A report was submitted requesting a medical survey upon the condition of the crew, and recommending that we should proceed to some convenient port for fresh supplies, fruits and vegetables.

The surgeon of the fleet made this survey, and concurred in the recommendation.

1st of July, the Raritan sailed, in compliance with this recommendation, to the River San Martin, sixty miles to the southward of Vera Cruz, where, it was represented, all the necessary supplies could be readily procured. Good and pure water was found in abundance, but this was the only article we could get. The few natives who reside in the forest near that part of the coast, kept themselves carefully concealed, and while watering ship we were not able to open any intercourse with them. By the 10th of July, we again joined the fleet before Vera Cruz, with the scurvy raging in a much more aggravated form than when we sailed. Those under treatment had grown much worse, for the want of proper remedies, while the increased labour and exposure of the crew in watering ship on an open coast, developed many new cases in its worst forms.

The Raritan, which had been so efficient a ship for two years, beating all other ships of war in reefing, furling, and in all her evolutions, with her

efficient and powerful crew of young men, was now barely able to navigate the ocean. For all purposes of war she was placed "*hors de combat.*" More than two hundred cases of scurvy were under treatment, and but few of those who were on duty were free from all symptoms of the disease. The character of the epidemic was directly opposed to other epidemics which we had encountered in the malignant disease met with in other parts of the world.

The infirm and broken-down landsmen, boys who had never been to sea before, and the marines, whose constitutions and habits had not yet been inured to the vicissitudes, exposures and privations of sea life, are, in the East Indies and on the coast of Africa, the first to suffer, while the robust and hardy seamen enjoy a comparative immunity. The scurvy, in its devastations on board the Raritan, reversed its march. The more vigorous, robust and plethoric the constitution, the more industrious and active the man's habits, in the same ratio were the liabilities to the attack, and the violence of the disease. At a time when the sick report was comparatively small, the most efficient of the crew were disabled, embracing those whose services could least be dispensed with, and whose duties were but imperfectly performed by others. These were the captains of tops, quarter-gunners, quarter-masters, boatswains' mates, the holders, and the strong and iron-framed seamen of the forecastle.

A large majority of these men had never been on the sick report during the cruize, and when first seized, attributed their pains to slight catarrhs, and did not, from a laudable ambition to do their duty, report themselves, until the disease was far advanced, and they were completely disabled. If there was any class of the men specified above who suffered more than the rest, it was the holders; not one escaped symptoms of the disease, and the first and second captains of the hold were among the worst cases. Both narrowly escaped with their lives, and for weeks it was doubtful if they would live from day to day. When this class of the ship's company found themselves racked with pains, covered with ulcers, and daily sinking, from being subordinate and obedient, they became the most clamorous and unruly. Many of them had fulfilled their part of the contract with the government. Their three years' service, for which they had shipped, had expired; they had seen much arduous service at sea; and they were now suffering from a disease which could only be cured by returning to port, where they desired to be discharged.

Another medical survey was called; and held by the fleet surgeon, by orders of the commodore. The report recommended that the ship should proceed to a northern port without delay. On the 17th July, the Raritan sailed from Vera Cruz for Pensacola, with more than two hundred cases of scurvy on board, and a large number of the crew with premonitory symptoms, who remained on duty, assisting in the navigation of the ship.

On the 24th, arrived at Pensacola, and eighty of the worst cases were immediately transferred to the U. S. Naval Hospital on shore. Fresh meats, vegetables, and fresh bread were freely served out to all hands, and so soon as sufficiently well, liberty was given to them to have a run on shore; all rapidly improved on board, and by the 15th of September the Raritan again put to sea, enabled to resume her duties in blockading the enemy's coast.

Symptoms.—The premonitory symptoms were almost as various as the number of cases. As we have already observed, the first cases were admitted upon the report with rheumatism. The lassitude and indisposition

to muscular exertion, which ordinarily usher in this disease, did not occur—there was a disposition to labour, frequently indulged to such an extent as to add to the severity of the disease. The pains were confined chiefly to the lower extremities and their articulations; were constant;—not presenting the usual exacerbations at night which ordinarily characterize rheumatism,—neither were they accompanied by pyrexia. The pulse was soft and natural, respiration easy; but the temperature of the cutaneous surface was below the normal standard.

The next symptoms in the order in which they presented, were sponginess and bleeding of the gums, with ulceration, which in some cases advanced so rapidly, that the teeth fell out early in the disease. There was great fetor of the breath, and ulcerations of the mucous membrane extending into the fauces. The inability to masticate, and the want of adaptation of the only food remaining (salt provisions) to the cases, induced rapid emaciation and exhaustion; and, it was not until then, that languor and lassitude took such complete possession, that the sick were incapable of making the slightest muscular exertion. This prostration was accompanied or speedily followed by great difficulty in respiration, as if there was a heavy weight on the chest, which produced, on an effort to move or converse, a sensation of faintiness or suffocation.

Œdema of the lower extremities was next in order of frequency; commencing at the ankles, it gradually extended, and in some cases there were puffiness in the face and general anasarca. Deep pits would frequently remain after pressure over the course of the tibia, before there were any indications of effusion to the eye. In one case, the captain of the mizen top, a young and active man, it terminated in ascites, from which he died at the Pensacola Hospital; and hydrothorax was the termination in a number of the invalids.

Where œdema existed, the countenance was bloated, and had a dull, lead-coloured appearance. The skin was cold and clammy to the touch, the urine was scanty and turbid, the alvine dejections small and irregular; while the patient complained much of pain and uneasiness in the bowels. In the milder cases, among that portion of the crew who remained on duty during our passage to Pensacola, almost universal œdema appeared. It was a common practice among these men, to amuse themselves by collecting in groups, and trying upon their own limbs who could make the deepest indentation with their fingers; and he whose indentation would be deepest and remain longest, while yet on duty, was considered the hero among his shipmates. Such are the expedients that sailors resort to at sea to sustain each other in an emergency, and to find amusement in their many weary hours! These effusions were among the first symptoms to disappear under treatment, or after our return to port; yet, upon a suspension of medicines and fresh diet, they would invariably return, in an aggravated form, and accompanied by other symptoms.

Macula or purpura scorbutica was, next to œdema, the symptom in order of frequency, while in the order of severity it should stand first in the catalogue. Deep brown and liver-coloured blotches, varying in size from the point of a finger to the whole extent embraced from the knee to the foot, or involving the whole of the inside of the thigh, were found in many cases on the patient reporting sick. This effusion of decomposed blood in the cellular tissue, sometimes presented the appearance of small petechia or flea-bites extending almost over the entire body. It was unaccompanied by itching or pricking. Urticaria had been very prevalent on

board ship since our arrival in the Gulf, among both officers and men; in many it was so severe that it prevented sleep for many nights in succession, but was not attended by any other disagreeable symptom. In no case did this nettlerash produce any aggravation of the scorbutic maculæ, so far as we could trace their existence in the same individual.

These maculæ did not always appear first on the inside of the lower extremities. The arms and face were not unfrequently the seat of the invasion, while the chest was the last to suffer. In one case, a petty officer, the captain of the maintop, presented himself with his face exhibiting the appearance of having been washed with diluted ink, or some dark colouring matter. My attention was called to the case by Dr. Potter, the medical gentleman on duty with me. The patient, Johnson, felt perfectly well, had performed his duties aloft all day, drank his grog, and still felt well enough to go aloft. For ten days his feet had been swollen, and his gums sore, bleeding upon slight pressure, but his energy and spirits had never flagged, and he had only reported to the doctor because he had suddenly turned "bloody black" in the face. He was cheerful, and desired much to return to his duty, which was not allowed. The following day he was a prisoner to his cot; the purpura appeared on the extremities, the gums and mouth were much worse, while severe pains racked every joint and limb.

This discoloration extended in several cases from the groin to the tip of the toes, involving almost the entire surface. In one, which will be noticed more at length, both lower extremities assumed an almost black appearance; the feet and legs became hard, indurated, and almost insensible to the touch, threatening that species of dry gangrene frequently met with in the hospitals of Europe, but which we have never encountered in this country. This patient exhibited from the commencement a pale and sallow aspect, was languid and exhausted, and incapable of any corporeal exertions. This discoloration of the skin was first to show itself in old cicatrices and injuries, and in the worst cases, these were disposed to ulcerate. These cicatrices were also the last to return to a healthy condition, retaining the evidence of the disease, long after the adjoining tissues had lost every trace of it. The colour varied much in different cases, from a light scarlet erythema to that of deep purple, almost black.

Purpura frequently presented itself in cases unaccompanied with other symptoms, where the individual was still able to perform some duty; but all those cases subsequently assumed a more grave and severe character, and required a more active and prolonged course of treatment, than in such cases where this symptom was not encountered.

Ulcerations were not very frequent, but where they did occur, or had already existed, they in every case proved extremely obstinate and intractable. They assumed a rapid disposition to extend, accompanied with a copious discharge, at times very offensive, and having an indolent and flabby surface, which all local applications failed to change into a granulating surface. Where these ulcers occurred in cases with cutaneous discoloration, they invariably assumed the worst aspect, spread with great rapidity, burrowed deeper, discharged more copiously, and not only were more difficult to heal, but also, by the drain which they opened to the system, accelerated the approach of collapse, from which recovery was difficult.

The slight petechiæ mentioned above were in some cases converted into small ulcers, which ultimately spread and ran into each other, occasioned by the patient irritating and scratching them, though they did not itch.

Nyctalopia occurred in five, and hemeralopia in two cases. One case of

the latter was so bad, that the patient could not move about the even decks, with which he was perfectly familiar, without the greatest difficulty. There were other affections of the eyes, owing obviously to this scorbutic diathesis, such as inflammation of the conjunctiva, induration and irritation of the ciliæ, accompanied with a copious acrimonious discharge. The usual collyria were used without any benefit, and the eyes improved or became worse, in proportion to the arrest or progress of the scurvy; and ultimately as the disease was eradicated, the ophthalmic affections permanently disappeared. Nyctalopia is a very common symptom of morbus maculosus Werlhofii, or the land scurvy, a disease we found, from some experience of it among our troops, to be totally different from that under consideration. In their symptoms, there is, in the early stages, a slight assimilation, but as they progress, in their pathological character they are perfectly dissimilar. Among the troops employed in Florida during the Seminole war, the morbus maculosus committed extensive ravages. Nyctalopia was a common symptom; some thirty cases of the disease occurring among the marine corps, co-operating with the army, were transferred from the field to the Marine Hospital at Washington then under our charge. These cases, as well as a number we witnessed at Point Isabel, in May, in the forces engaged under General Taylor, were totally distinct from the scurvy as it occurs on board ships at sea. Purpura, œdema, the cadaverous and fetid effluvium which follows the extreme emaciation, the fainting upon the slightest exertion, and the extent of disease in the respiratory and circulatory systems, which always occur in the scurvy on board ships, are never met with in the land scurvy. In the latter, we have sponginess of the gums, ulceration which terminates in dysenteries and fevers, the first induced by a cachectic diathesis, but never involving that complete anemia of the blood, which amounts to a universal septic tendency.

The symptoms of the disease, as they appeared on board the Raritan, varied materially from such as are laid down in books. Lassitude and indisposition to muscular energy were not among the symptoms which ushered in the disease; there were generally great activity and not unfrequently cheerfulness, good appetite and sound sleep at night, for weeks after the teeth were loosened, the gums ulcerated, the limbs œdematous and discolored. The nervous system was among the last to be invaded, and then it was not "an indisposition to corporeal exertion," but an actual disability. The countenance became pale, languid, cadaverous, the respiration oppressed, irregular, and the pulse, feeble, fluttering, intermittent, simultaneous with this muscular prostration. Slight efforts to turn, sit up, or move about, were followed by tremors and syncope. When this class of symptoms set in, the strides of the disease were rapid, everything indicating without speedy aid, an early fatal result.

In every case where the disease was so far advanced, the respiratory system was much involved. There was also a manifest reduction of the temperature of the body in every aggravated case. In two cases well-developed symptoms of angina pectoris presented, and the paroxysms were accompanied with the most distressing pains in the chest and arms. The patients themselves expressed the greatest apprehension of instant suffocation. Both these cases recovered from this angina, on their transfer to the hospital, but when we last saw them, their emaciated and tottering frames gave the incontestable evidence of permanently impaired constitutions.

There were but two classes of symptoms which made such irreparable

inroads on the constitution; from all the other symptoms the health became again perfectly restored; these were the oppressed, laborious and difficult respiration, the other irregular, obstructed and imperfect action of the heart. Paroxysms of dyspnœa were frequent in those cases; the inspirations were short and rapid, and performed chiefly by the action of the intercostal muscles, and were performed with much labour by the patient, imparting to the countenance the impression of suffocation, accompanied by palpitations which compelled the patient to sit up. The contractions and dilatations of the heart were irregular, at times intermitting and indistinct, with a great sense of anxiety in the precordia. In the midst of these symptoms the pulse was scarcely perceptible at the wrist, the extremities were cold, and the countenance assumed a leaden hue; auscultation, so far as practicable on board a crowded ship of war, gave us but little aid in detecting the character of organic derangement. In several cases the sounds emitted were those of hypertrophy; but the number of these cases were limited, compared with the indications of atrophy and diminution of the cardiac functions.

Febrile symptoms never supervened until after the development of these symptoms, involving the functions of the heart and lungs; after that, they were invariable. There were slight rigors or a mere coldness of the surface, in some cases, before the pyrexia developed itself. In most cases, even these were not observed. The pulse never became full and strong, but was small, frequent and corded, the skin warm and pungent (calor mordicans). The urine was small in quantity and high coloured. The bowels were readily influenced by small doses of aperients, the dejections being small and not unnatural.

The febrile paroxysms, which were always slight, assumed the character of double intermittents, there being two exacerbations and remissions within the twenty-four hours, and never were met with, as has been before observed, until the advanced periods of the disease. In this stage, fever rapidly assisted to exhaust the feeble forces still remaining, and notwithstanding it was so slight, that, in other conditions of the system, it could have produced but little injury, it here speedily prostrated the patient, from which prostration but few permanently recovered.

The fortunate arrival of the Raritan in Pensacola, at the very moment when the scurvy was putting on its most ghastly aspect, saved the lives of many, but left them for the future with impaired constitutions.

Sixty-four of these unfortunate cases, embracing most of our petty officers, were left in the hospital at Pensacola on our return to Vera Cruz, few of whom will ever again be restored to health and strength. A number of them, after lingering for months, we learn, died at the hospital, notwithstanding the possession of every comfort, and the zealous attentions of that distinguished physician and universally respected man, Dr. Hulse, the surgeon in charge.

In the enumeration of the symptoms of scurvy, it will be observed that they divide themselves into two distinct classes. While suffering from the first, the patients were able to eat their ration, or at least a portion of it, drank their grog, were lively, industrious and cheerful, and most unwilling to apply for medical treatment. This stage would last from several weeks to as many months, the disease being warded off by occasional small supplies of fruit, vegetables or fresh meat. In the second stage, cheerfulness and hope had fled, leaving pain and despair. Loathing of food, loss of rest,

inability (not disinclination) to stir or move without fainting, palpitations, and a sense of suffocation; while the rapid decay of the body, the cadaverous putrid odour, and the Hippocratic countenance, gave but too unfailing testimony of the near approach of death, unless relief was speedily obtained. On board the Falmouth, during her passage from Pensacola to Boston, Dr. Nelson informs us that cases of this character were numerous. In his own language, although he had selected the medical profession from his own choice, had studied and practiced it with pleasure, yet so loathsome and offensive were his duties among the sick and dying with scurvy, that the recurrence of similar scenes would drive him from the service.

From a large number of cases on our note-book, we will abridge three, as illustrating the various forms which the disease assumed. In the first, œdema, effusions and petechiæ terminating in ulcerations, occurred; in the second, universal purpura of the inferior extremities, terminating in dry gangrene; in the third, the lungs and heart were invaded in the worst form, from which the patient was for a time revived, but the case ultimately terminated in death.

Case I.—Edward Brandis, musician, aged 45, of a robust and sanguine temperament, had been in uninterrupted good health for more than two years, was admitted on the sick report on the 29th of June. When off Point Isabel, in May, first experienced scorbutic symptoms, œdema of the feet and ankles, which disappeared on an acid treatment, with occasional use of fresh animal food. Within the last few weeks, this effusion again returned, and is now so extensive as to interfere with his walking about deck. The feet, ankles and legs are greatly distended with a puffiness and fullness about the eyes, showing a disposition to anasarca. The arms and legs are covered with numerous petechiæ, resembling flea-bites; many on the legs are opened or covered with a small scab, produced by the patient's rubbing and irritating them. His general health never was better; his appetite is good, sleeps well, and is of a most cheerful and contented disposition. He says, that he is heavier in flesh at present than he has ever been before, weighing nearly two hundred, with all the activity and strength of his youth. The gums are but slightly affected; and give him no inconvenience.

By the 5th of July, the symptoms had all increased in severity; the effusion was more extensive, and the ulcerations of the petechiæ increasing in extent, with a more copious discharge. On the 10th, the progress of the disease was still more obvious, although he had been on the shore on the 6th and 7th, with the parties employed in watering ship at San Martin. He passed both these days much to his delight, bathing in a pleasant mountain stream, which he felt convinced would cure him. In this he was much disappointed, as severe pains in the muscles and bones were felt for the first time after these bathings. Day after day, the effusions in the extremities continued to augment; the ulcers became more extensive and more numerous, with indolent, unhealthy surfaces, discharging freely. The pains in the legs increased to such a degree, that the patient was only able to move after much exertion. This increase of the symptoms, for which he was admitted on the sick report, was not followed by any involving other organs. Digestion continued good; the respiration was unaffected; he was able to make the strongest exertions in playing upon wind instruments, while the pulse and heart continued normal. In this condition he was transferred to the hospital on the 25th of July, with his legs enor-

mously enlarged, and covered with troublesome ulcers. His spirits never flagged, and he never was more cheerful. At the hospital, as on board, he continued to amuse his fellow patients, the officers and their friends, with his guitar, on which he excelled. The transfer to the hospital, where all were abundantly supplied with everything they so much required, was followed by a speedy convalescence.

While still in a debilitated condition, Brandis, like a majority of his shipmates at the hospital, no sooner was freed from the scurvy than he was seized with the epidemic (pernicious fever) which raged so severely at Pensacola during the past summer. He, however, ultimately recovered.

Case II.—Birdsy Curtis, holder, aged 26, tall and slender, of a lymphatic temperament, had been stationed for many months in the ship's hold, where, in consequence of being deprived of light and air, he had become blanched and etiolated. His constitution had never been robust, yet he had enjoyed good health throughout our cruize on the coast of Brazil. He reported himself sick on the 5th of July, at the time presenting a most miserable and exhausted aspect. He was much emaciated, and for several weeks had been bleeding freely from the gums, most of his teeth being loosened. He declined to report himself as sick earlier, as he expected the ship would proceed to port, and he felt sufficiently well to assist at his duties. Upon examination, his legs were found discoloured on the inside from the knees to the toes; the muscles were almost completely wasted away; his gait was weak and tottering. Severe pains in the muscles and bones racked every part of his frame; his breathing was oppressed and difficult, pulse small, soft and intermitting, and the temperature of the whole body some degrees below the healthy standard. The discoloration extended round the leg, and along the whole length of the inside of the thighs, while it also assumed a darker hue, enveloping toes, feet and legs, as perfectly as a stocking, after the lapse of a few days. The prostration and inability to move also increased, and by the 12th, he was unable to leave his cot. Purpura now appeared on the inside of the arms; the gums were deeply ulcerated, breath fetid, eyes sunken, and countenance ghastly. Respiration was attended with severe pain in the chest, and oppression. The pulse became more feeble and shattered, while a slight but constant irritative fever rapidly contributed to exhaust the patient. The toes and feet were now the first to put on the form of dry gangrene. They became hard, immovable, cold and black. This appearance extended daily, accompanied with much pain, until the ankles, legs and knees of both sides were involved. So rapid was its progress, that it had reached this extent on the 14th of the month. Skin, cellular tissue, muscles, tendons and ligaments had all simultaneously assumed the hardness and sensation to the touch of wood, at the same time that they were cold and black. The irritative fever could not be subdued, while the pains, ulcerations, exhaustion and fetor, indicated certain and speedy dissolution.

On the 15th, Curtis was transferred, with much suffering, to the steamer Princeton, bound to Pensacola. On board the Princeton, fresh provisions were comparatively abundant. Meats, fruits and vegetables were used externally and internally, which kept the miserable sufferer alive until his arrival at Pensacola, after a short passage of four days. He was immediately landed, and while being carried from the landing to the hospital, he fainted in his cot; those in charge of him believed him dead. For some days after his arrival, it was doubtful whether he would live from day to

day. Milk, acids and fruits were freely administered, while his blackened and insensible legs were frequently rubbed with lime juice, and enveloped in scraped raw potatoes.

After the sixth day, the irritative fever began to subside, the pain and difficult respiration abated, while the pulse became more natural. This improvement was slow; at the end of three weeks, he was able to take food with some appetite, was free from pain when kept quiet, and slept soundly at night. His gums ceased to bleed, and the fetor from mouth and body had disappeared. From this time he continued gradually to improve, but not with rapidity. Six weeks after his admission into the hospital, when I last saw him, his toes and feet, with the integuments and muscles as high as the knees, still retained the hardness and sensation to the touch of wood. He was then able to move about his ward with the aid of crutches, while the deep-seated muscles and tendons moved in their indurated envelopes of hardened tissues, without producing the slightest fold or wrinkle, just as the foot moves in a wooden shoe. He was then cheerful and improving, but when last heard from, he had not sufficiently recovered to accept his discharge, although more than three months had elapsed.

Case III.—Robert Emmett, seaman, aged 30, had suffered from soreness and bleeding of the gums for six weeks, before he was disabled from performing his duty. On the 28th September, was admitted upon the sick report, suffering from the most severe pain in the chest, accompanied with a sense of suffocation, unless elevated. The action of the heart was turbulent and oppressed, with an expression of the countenance apprehensive of immediate suffocation. The surface and extremities were cold, with a pulse scarcely perceptible.

Up to the period of his admission, he had enjoyed excellent health, felt well and cheerful; there were no macula, discolorations, effusions or pains in the extremities. His digestive and assimilative organs were apparently unimpaired; the only evidence exhibited of any morbid action going on in the system, was confined to the slight tenderness of the gums, which were not sufficiently severe to oblige him to apply for assistance. On this day he had been taken suddenly so ill, that he was incapable of making any exertion; the symptoms were not unlike those we meet with in the last stages of pneumonia combined with pulmonary congestion. On the second day, all the symptoms were more aggravated; the gums were ulcerated and offensive, the teeth loose, the countenance more haggard and distressed, while the respiration was short, hurried, and laborious. At times there were severe palpitations of the heart, while its actions were intermittent and irregular. The skin was cold, clammy and exsanguious, without any tendency to ulcerate or discolour. The necessary efforts to move in his cot, occasioned severe pain in his extremities, accompanied by exhaustion or a disposition to syncope. The seat of his greatest suffering was in the chest. There was not the acute pain which indicates pleuritis or recent pneumonia, but a sense of weight and constriction which appeared to threaten suffocation, and which gave to the features the expression of great fear and anxiety. There was great loathing or inability to take food or drinks, with constipation, and a small secretion of high-coloured urine.

He continued to sink rapidly, with exhaustion upon the slightest efforts, while the breath became more offensive, and the expression more cadaverous. The muscles and integuments on the lower extremities now assumed

a more unnatural appearance; they felt cold, clammy and doughy. Upon being pressed aside or pitted, they did not again return to their natural position. This was not owing to effusion, but to a change in texture or vitality in the parts, which had deprived them of their natural elasticity. The skin and muscles looked as though ready to drop from the bones. In this condition he was transferred to the hospital, where, by diligent, careful and able professional attention, after much suffering, there was some improvement. His limbs were kept enveloped in fresh vegetable acids, while those articles most required were administered at frequent and short intervals. With much nursing his life was prolonged, but he never recovered. When improving, his indulgence brought on a severe attack of disease under which he died.

Cause.—The preceding history of the scurvy on board the Raritan, renders the cause of the appearance and extension of the disease on board that ship sufficiently obvious. It was there shown, that the hold and berth deck were imperfectly ventilated, during two years' cruizing between the tropics. The ship was kept much of her time in ports, where fresh meats and vegetables could not be procured, while upon her South American cruize, and after her period of service had terminated, when the time for which most of her crew had shipped had expired, a second still more arduous duty devolved upon the crew, in consequence of our being involved in a war. During a period of three hundred days, the ship's company of the Raritan had fresh meats served to them but nineteen times, and then, with but a small quantity of indifferent vegetables. The occurrence of scurvy, under these circumstances, in a warm climate, where the crew were frequently exercised at their guns, with at times on allowance of water, was not a subject of surprise. It is, indeed, more surprising, that the disease did not manifest itself sooner, and that there were not more fatal cases. Its long latent condition, the few fatal cases, and the speed with which it was eradicated from the ship, were all owing to the regularity of living and the police which are enforced on board ships of war. The same disease, under the same circumstances, on the crowded decks of merchant ships, between the tropics, would doubtless have assumed a dreadful form. Our merchant whaling ships are the only vessels in which scurvy prevails to any extent at the present day. These ships continue for many months at sea, and when in port to refit, remain but a short time. In many there is but little regard for personal cleanliness, and the ships are frequently very offensive. On board these whale ships, we have seen scurvy in its worst forms, but it always occurred in vessels where their universal anti-scorbutic, fresh potatoes, had been exhausted for some time. So long as these lasted, the disease never made its appearance.

Salt beef and pork, which constitute a portion of the daily ration of the seamen at sea, when long preserved, lose their nutritive qualities, and in proportion to the time they are kept, become unwholesome and innutritious. The navy being furnished with these articles by contract, they are often long kept, and nearly spoiled before they are served out. When new beef and pork are delivered to the government, in a sound and wholesome state, they are carefully stowed away until the old stock on hand is consumed; by which time, the new has reached the same condition as that which was nearly in a state to be condemned, if surveyed. The crews of our ships abroad are thus almost constantly eating old provisions, an evil which can-

not be well avoided, unless, by the more abundant supply of fresh meats on all foreign stations.

The recent change in the navy ration, which furnishes salt meat every day in the week, instead of allowing one day, as heretofore, in which no animal food was served out, has apparently increased the disposition to scurvy on board our ships of war. Agreeably to the last accounts from the East India squadron, the scurvy had made its appearance on board the U. S. ship Columbus, then at the Sandwich Islands. We served on that station and in the Pacific some years ago, under the former ration law, when on Fridays, sailors lived upon vegetables alone, and although the ship to which we were attached was eleven months out of thirteen, actually under way at sea, yet the scurvy did not make its appearance. It is a most useful regulation on board ship, to have vegetables alone served to all hands at least one day in the week.

The appearance of scurvy among the crew of the Potomac recently placed in commission, with an excellent police on board, would be a subject of surprise to those not familiar with the circumstances which led to it. We served for three years on board that ship, at sea, and consequently know her well. In every respect is she a sister ship to the Raritan. In tonnage and in the internal arrangements, by which the berth deck and hold are very low and imperfectly ventilated, they are precisely similar. The apartments of the officers are small, without light, and with very small hatches communicating between the berth and gun decks.

From the day of sailing from the dock-yard, up to the time of her arrival in Pensacola with the scurvy on board, salt provisions only were served out, and both the beef and pork had been long kept before using. The beef particularly was much deteriorated, and much of it, as was also the case on board the Raritan, was condemned by a survey of a board of officers, as unfit for use. Dr. Dodd, the experienced surgeon of the Potomac, attributed the unwholesome, indigestible qualities of the meats on board the P. to the quality of the salt used in the curing of the meats; a subject to which no attention has heretofore been directed, and the great importance of which must be obvious to all. It is to be hoped that in furnishing supplies, this will be attended to by the inspecting officers.

The Falmouth, corvette, on which the scurvy appeared with so much severity, had been two years in commission, and the ship herself, as well as the crew, became diseased by long exposure to hot weather, cruizing between the tropics. In this respect the Falmouth and Raritan were similarly situated; both ships had been long at sea, exposed to a burning sun, with their ships' company long confined to salt provisions, while the ships' holds had not been thoroughly broken out and ventilated. Our ships of war in this respect labour under many disadvantages. A merchant vessel is broken out to the kelson, thoroughly cleaned and ventilated every time she enters port, while this cannot be perfectly done in our public ships, until the termination of her cruize of three years. The causes of scurvy in the squadron employed in the blockade of the Mexican ports in the Gulf, during the past summer, may all be summed up in a few words. Protracted cruizing between the tropics, unwholesome and innutritious salt provisions, vitiated atmosphere on board resulting from imperfect ventilation; at times, a reduction in the quantity of water; and, in the crew of the Raritan, the despondency and disappointment resulting from being kept on board ship after the expiration of the period for which many of the crew had shipped.

Pathology.—The humeral pathologists, in placing the primary seat of this disease in the changed condition of the blood, on which the subsequent morbid change of the solids is dependent, come nearest, in our opinion, to a correct view of the pathology of this disease. The only careful analysis of the blood of scorbutic patients, that has fallen under our notice, is that of Dr. Busk, the surgeon of the Dreadnought Hospital ship, moored off Greenwich Hospital, and where more recent cases of diseases among seamen are treated than in any other institution. This liberal charity is free for the admission of sick seamen from all nations, and is supported entirely by private donations. During a visit on board, several years since, we found a number of American seamen comfortably provided for. Almost every government of Europe, we learned, was among its contributors, even those without a marine, while the United States, the citizens of which are constantly receiving its benefits, does not contribute towards its support. On the occasion of our visit, cases of scorbutus were under treatment, and among them were two terminating in dry gangrene of the lower extremities, analogous cases to that of Curtis, detailed above. The analysis of the blood, made from three well-marked cases brought for treatment to the Dreadnought, is as represented in the following table.

	1	2	3	Healthy blood.
Water - - - -	849·9	835·9	846·2	788·8
Solid constituents - -	150·1	164·1	153·8	211·2
Fibrin - - - -	6·5	4·5	5·9	3·3
Albumen - - - -	84·0	76·6	74·2	67·2
Blood corpuscles - -	87·8	72·3	60·7	133·7
Salts - - - -	9·7	11·5	10·9	6·8

"These analyses are sufficient to disprove the general notion that in this disease the corpuscles are dissolved in the serum. In the blood taken from these scorbutic patients, the separation into serum and clot was as perfect, and took place as rapidly, as in healthy blood. In two of the cases, the clot was buffed and cupped."

The observations made on the blood on board the Raritan corroborate the above experiments, the separation of the blood into clot and serum being rapid and perfect; but the clot was small.*

Animal chemistry promises not only to reveal the true nature of this disease, as well as of many others, but also to furnish us with means to guard against it, and effectually to remove it after it does occur. Liebig and Simon have clearly proved, that, when the oxides of protein predominate in the blood, or that when they accumulate in any part of the system, that general or local inflammations are the certain results. The false membranes which form on the mucous and serous surfaces, are found by analysis to be composed of oxidized protein. Inflammation is combated by endeavouring to diminish the quantity of trioxide of protein, and to hinder its formation in the lungs. Venesection and purgatives have this effect, and hence their efficiency in the treatment of inflammatory diseases. An opposite condition of the blood obtains in scurvy.

Spanæmia or poverty of the blood, in which the amount of fibrin and of

[* These observations are further confirmed by the recent analyses of scorbutic blood by MM. Becquerel and Rodier, and by M. Andral. The blood, in these cases, so far from presenting the state of dissolution usually described, coagulated firmly, and the fibrin was found generally to exceed the physiological mean, never to fall below it. See *Quarterly Summary* of this Number.—Editor.]

corpuscles is diminished, while the proportion of water is higher than in the healthy state, is the condition in which the blood is found in this disease. The impropriety of blood-letting under those conditions is so great, that venesection must be carefully avoided, and but few opportunities are thus offered for an investigation and analysis of that fluid.

Protein is the basis of albumen, fibrin, casein, and these are the commencement or starting points of all the tissues, and this, the basis of the three aforesaid animal principles, may be obtained from similar elements in the vegetable kingdom.

Liebig observes: "As far as our researches have gone, it may be laid down as a law, founded on experience, that vegetables produce in their organism, compounds of protein, and that out of these compounds of protein, the various tissues and parts of the animal body are developed by the vital force, with the aid of the oxygen of the atmosphere, and of the elements of water."

Highly proteinized vegetables are the principal food of herbivorous animals, and in proportion as the plants contain this ingredient, are they nutritious. The products of these vegetables are identical with the constituents of the blood, and the blood of animals, chemistry has demonstrated, is formed from these substances. When, therefore, we find men compelled to subsist for a long period upon animal food almost exclusively, which is destitute of protein, scurvy will be found to be one of the forms of disease which this imperfect nutrition will induce.

"Those vegetable principles, which, in animals, are used to form blood, contain the chief constituents of blood, fibrin and albumen ready formed, as far as regards their composition; all plants besides contain a certain quantity of iron, which reappears in the colouring matter of the blood. Vegetable fibrin and animal fibrin, vegetable albumen and animal albumen, hardly differ even in form; if these principles are wanting in the food, the nutrition of the animal is arrested."—(*Liebig.*) This was the case with the seamen who suffered from scurvy in the fleet, during the past summer.

The whole condition of the scorbutic patients clearly proved that the morbid actions were going on in the blood. The extensive ecchymoses, purpuræ, and petechiæ, the rapid tendency to ulceration in all parts of the body, the diminished quantity, high colour and tendency to speedy decomposition of the urine, all evince that the blood is the seat of the pathological changes going on.

To the general received opinion, that the primary cause of the disease is in a deranged condition of the chylopoietic function, we cannot concur. In the vast number of cases which came under our immediate notice, there were but few that exhibited symptoms of disease in the digestive organs. In a disease where the process of sanguification is so much involved, we might expect there would be much derangement in the organs of chymification. Such, however, is not the case, excepting so far as they are deranged by the long application of innutritious food. In the worst cases, the digestive and assimilative organs retained their vigour and activity, after the nervous, circulatory and respiratory systems were prostrate. To this unimpaired condition of the digestive organs, may be attributed the recovery of many cases after our return to port, where, had there been any disease in those organs, all hopes of restoration would have been fruitless.

Treatment.—The mild cases of the disease which first presented, were

all relieved by a course of acidulated drinks. The citric and tartaric acids were ordered for this purpose, and the small quantities of fruits which were occasionally procured from shore, were distributed among the patients, and always with benefit. The rheumatism with which the disease was at its first appearance frequently associated, received the usual treatment, with but little or no alleviation, except from the severe nocturnal pains which were frequently soothed by morphia and opium, and the acidulated drinks and fruits.

Lime juice, citric, tartaric and acetic acids, were freely administered, but the number of cases requiring these articles became so great, that the usual supplies on board were soon exhausted. The small quantities of fresh vegetables and fruits, in the officers' messes, were presented to the medical department for the use of the sick, of which the largest quantity on board the Raritan came from the cabin. At one time a liberal supply of potatoes and onions was procured, which were given raw to the sick, and no articles prescribed exerted a salutary effect so promptly as potatoes in an uncooked state. On board our large fleet of whale ships, raw potatoes are served out daily, and they are found so efficacious that they constitute almost the only anti-scorbutic carried out by them. Whenever we could procure even a small supply, the improvement in the sick was too obvious not to prove their superiority to all other remedies administered. It might be supposed that, when cooked, they would be equally efficacious, but such was not the case.

The basis of the potato is starch, and from the facility with which it is transferred into healthy nutritious matter, we may expect some of the same salutary effects from the use of starch itself, in the treatment of scurvy. Starch, indeed, in conjunction with lime juice, we should judge from their elements, and the known condition of the constituents of the blood, would be highly efficacious, if not a specific, in the treatment of this disease. We trust that at the first opportunity which may present to our medical *confrères* in the service, that the efficacy of starch, in conjunction with lime-juice, may be freely tested. Of its success we are sanguine.

Numerous well authenticated instances are on record proving that the long boasted specifics, lime and lemon juice, will not in every instance prove effectual. On board her majesty's ship Leander, the scurvy prevailed to a frightful extent, although lemon juice was plentifully administered during all of her passage from Trincomalee to the Cape of Good Hope. Yet to the introduction of lemon juice as a portion of the seaman's ration, as early as 1795, must be attributed the almost complete extinction of this scourge of the sea, from the British Navy. Before that period, the existence of this disease on board ships performing long voyages, was universal. The destructive ravages of this disorder are awfully and vividly portrayed in the narratives of the early English navigators, particularly in those of Sir Francis Drake, Davis, and Cavendish. Lord Anson, in the course of his voyage round the world, lost more than four-fifths of his officers and men. Sir Richard Hawkins remarks, that within his own naval experience, he had known more than ten thousand men perish by the scurvy. Prior to the year 1796, more sailors, it is believed, fell victims to this scourge, than to the united consequences of naval warfare, and the various accidents incidental to a maritime life. These evils all disappeared for a time, upon the universal introduction of lemon juice; but it would appear, from the recent history of the French, English, and our own marine, that the disease will still at times assume the same intensity with which it formerly raged. This may

be owing to less care in enforcing the necessary precautions, or to the protracted cruising and arduous duties, which must occasionally, from the nature of the service, devolve upon particular ships, and which, in a time of war, cannot be obviated. In such cases we must ward off the evil as long as possible, and when it is upon us, without delay resort to such means as we know will prove effectual.

What years of experience have proved to be so serviceable, lemon juices and vegetables, analytical chemistry now comes with her discoveries, and proves to contain just such elements as the body is deficient in. The discovery of protein in vegetables alone, and the part it performs in nutrition, only confirm, like all other important discoveries, the simplicity and the harmony of all the operations of nature.

All the remedies administered for the treatment of scurvy on board the ships in the Gulf, were only palliative. A change of food, abundant supplies of water and pure air, were indispensable for a perfect eradication of disease, and these were not obtained until after our arrival in Pensacola. When the Raritan suffered most, and when most of the articles adapted to the treatment had been expended, the commanders of the English and French squadrons off Vera Cruz very kindly assisted to procure a liberal supply of limes and lemons, with some fresh meats, which proved most seasonable, and materially meliorated the disease, and in some instances saved the lives of the sick. For these kind and seasonable attentions, we take this occasion to return our grateful acknowledgments.

The Raritan arrived at Pensacola on the 24th of July, and from that date the administration of all medicines may be said to have ceased. Fresh meats, fresh bread, potatoes and onions, were served out to all who remained on board. Eighty-four of the worst cases were transferred to the hospital, where acids from the recent fruits, with milk, were administered to the worst cases, while such as were able were placed upon a more substantial diet. In many of the worst cases, the improvement was slow. Many of the scorbutic patients, when convalescent, were seized with the epidemic fever, which raged with great severity at that port during the past autumm; while others were prostrated with autumnal intermittents of an obstinate character, which resisted all treatment until the appearance of cold weather.

The whole treatment of sea scurvy may be summed up in a few words. Supply the system freely with protein, by giving patients freely those vegetables in which it most abounds. Many English naval surgeons maintain that vegetable acids alone are not sufficient to cure scurvy, and that a portion of fresh animal food is necessary for a cure. In the first part of the opinion we cannot concur, and although fresh animal food will accelerate a cure, and should always be resorted to when it can be procured, yet the vegetables are all that are necessary in such cases; and where the fruits and vegetables in a recent state cannot be obtained, starch and lemon juice, both of which can be carried at sea in sufficient quantities, will give us all that is required for the prevention and cure of scurvy on board ships, when combined with cleanliness, ventilation, abundance of water and cheerfulness. Where there are mental despondency, dejection and disappointment in a crew suffering from scurvy, as was the case with that portion of our crew whose period of service had expired, almost every effort to restore the health, so long as these depressing passions continue in operation, will be unavailing. The humane physician and the prudent commander would in such cases recommend a discharge of the crew, and a run on shore.

ART. IV.—*Case of Phosphatic Deposits, terminating in Deposition of Lithic Acid and Lithate of Ammonia.* By A. V. LESLEY, M. D., Brooklyn, New York.

———, while residing in the country in 1840, severely injured his back by lifting a heavy weight. The immediate effect was pain, which confined him to bed for several days. From this time a constant pain was experienced in the loins, especially severe at the fourth and fifth lumbar vertebræ. This was borne by habit, and but little was done after the first few months, in which plasters of Burgundy pitch and stimulating lotions were used without effect. A recumbent position allayed the pain, which was aching and exhausting. General health good, though being exposed to miasma, he became a victim to intermittent and remittent fever. Occasionally during the succeeding years he noticed that the urine was very turbid, and portions issued milky from the urethra; still, as no acute pressing symptoms occurred, no attention was paid to it until the summer of last year (1846), although in 1843 he had experienced three attacks of gravel, passing a small white calculus at the close of each. On recovering last summer from a *coup de soleil*, the urine attracted notice by its almost uniformly turbid appearance. The pain in the back still continued, but not so violent as before. Having been actively engaged in professional pursuits in this city during the past winter, with fair appetite, and no perceptible cause for the gradual loss of strength and comfort, he applied to me for relief.

May 10*th*. After a superficial examination of his case, I commenced a full series of observations on the then condition of the secretion, previous to adopting any plan of treatment. This series consisted in a record of the temperature and weather, the quantity of urine passed immediately on rising from bed, after breakfast, before dinner, after dinner and at night; the specific gravity of each portion; from these the amount for the day, the average specific gravity, and the solid contents of the urine were obtained; the state of the pulse, the microscopic appearances, the diet, amount of exercise, &c. The microscope used was an excellent achromatic of one-tenth inch focus.

At this time he had been married three years, was between twenty-five and thirty years of age—weight 134 lbs.—appetite very variable, generally large, sometimes insatiable. There was a considerable degree of thirst; the skin acted very freely on slight exercise; the bowels moved regularly, inclined to costiveness; the nervous system was excessively irritable—the mind morbidly active, occasionally gloomy; great vigilance, and sleep was short and unsatisfactory; slight noises caused violent painful palpitations of the heart, and a steady pain was experienced between the fifth and sixth ribs over the heart, whenever he was exhausted by fatigue. At the same time the brain suffered at times from the sun's rays. The pain in the back had diminished, but was very annoying. The pulse was somewhat hard, full and irregular, beating about sixty-five morning and night, which was above his natural range; from this it mounted, from slight causes, to eighty and even ninety, quickly subsiding again. Strength steadily diminishing, although under good exercise and diet.

The urine, during the period of examination, was, with the exception of some few mornings, always turbid, and often very offensive in odour. It was feebly acid generally, on some occasions neutral, and but once found

to be alkaline. The specific gravity varied from 1·026 to 1·051, generally above 1·030. The deposit was copious, white, and consisted of the phosphates of ammonia and magnesia. It subsided rapidly after passing, and in fully one-third the number of passages, the phosphates issued either at the beginning or termination of the turbid stream, dense and milky. The urine displayed the iridescent pellicle in a few minutes after standing, and putrefaction began in from four to twenty hours.

The crystals were generally of the ordinary prismatic form, though repeatedly beautiful specimens of the foliaceous and stellar varieties were observed, either mingled with the prisms, or constituting the entire type of the specimen examined.

The diet consisted of the full range of the table, the proportion of meat being large, and a glass of beer two or three times a week; a moderate amount of tobacco was consumed both by smoking and chewing.

Rest, sleep, and abundance of water diminished the turbid character, and of course the specific gravity, but did not appear to influence the quantity of deposit. On the other hand, fatigue, a high range of the thermometer, reduced allowance of water, increased quantity of tobacco, raised the specific gravity, increased the quantity of deposit, and precipitated it before leaving the bladder.

The average specific gravity before treatment commenced, was 1·03851 —average quantity ℥xxxvj—average quantity of deposit grs. 1839.084.

24*th.* The first step toward treatment was the withdrawal of the tobacco, substituting gentian root, and the effect was visible in a diminution of deposit. The amount of vegetable food was curtailed, it then forming about one-third the whole diet—the patient was sent to the country to obtain rest and freedom from business. After an absence of a fortnight, he returned in the same state, and immediately after ran down with great rapidity. Coffee and tea were forbidden, pale ale being substituted at breakfast and supper; gentian, quassia and camomile taken regularly; the supply of vegetables was still further reduced.

The deposit still continued, but in a reduced quantity, the strength, however, failing rapidly.

June 17*th.* Made the diet purely animal, with the exception of lettuce twice during the week, to relieve the tedium of constant meat diet. The urine now became clear except after dinner; all the specimens yet showing the triple phosphates.

25*th.* Eight days after the entire withdrawal of bread and vegetables, lithate of ammonia was deposited after dinner, and the next morning lithic acid; the phosphates in the middle of the day and at night. After a few days of alternation, in which the phosphates were rapidly diminishing, the lithic acid and the lithate usurped completely the place of the former. During this period of treatment, the specific gravity averaged 1·03426; the quantity ℥34·58; the mean quantity of solids grs. 1379·23. The state of the patient was about the same; the pulse being rather more irritable, and standing in the morning sixty-nine, in the evening sixty-six.

The meat diet was kept up until the phosphatic tendency was supposed to have been overturned by the lithic acid, and rice, salads, and a little potato were introduced. The strength began to recruit; the pain of the back was sensibly diminished. Oxalate of lime was now deposited constantly in large octahedra; on three days the oxalate assumed the form of dumb-bells. On the 5th and 6th July, the patient had a slight attack of diarrhœa, after which the oxalate disappeared entirely.

During this period, from the disappearance of the phosphates to the 6th July, 11 days, the average quantity of urine was ℥25·7; mean specific gravity, 1·0313; the solid contents had fallen to grs. 1039.09.

The case now became one of lithic acid, and lithate of ammonia. The symptoms were increased gradually in severity, the temporary gain during the deposit of the oxalate was lost, a severe darting pain in both kidneys was added, and a morbid vigilance prevented sleep. The weight fell to 123 lbs. Business, which had been attended to previously, was thrown completely aside, and the carbonate of iron given three times per day, gr. x, rubbed up with conserve of roses. With this the following prescription was ordered: ℞.—Tr. gent., tr. cinchonæ, tr. hyoscyami, āā ℥j; tr. camphoræ ℥j;—a teaspoonful to be taken before each meal and at bed-time. The iron given with the conserve soon disgusted, and the ammonio-citrate in doses of gr. x substituted. Cold sponging to the loins was persevered in throughout the whole of this period.

The carbonate of soda was also used. The diet was principally vegetable; meat allowed in small quantities; acids withdrawn, and tobacco was resumed. Little or no improvement took place for some ten days, when the specific gravity slowly fell, the deposits took place less frequently, the pain of the kidneys declined, and that of the back was less severe, though the strength was stationary. The country was again resorted to, and the patient remained there about a month, during which the same course was pursued. There was a slight improvement during his absence.

The urine at this time was always clear in the morning, high-coloured, of high specific gravity, the acid preponderating. After breakfast, urine pale, turbid, depositing the acid and the lithate; after dinner, the lithate constituted the bulk of deposit, which was copious, always *white*, frequently issuing in a thick, milky stream; some of the particles at times aggregating into little firm masses of the size of pins' heads. At night the secretion was clear again, the salt predominating.

The microscopic appearances were very varied; the usual character of crystal was that of the lozenge, alternating and mixed with the square and the hexagonal table, the latter at times of great thickness, producing the appearance of hexagonal prisms. The varying forms were curious, and could not be explained by the circumstances of the day; sometimes a specimen would contain but one shape, another would have two, three, or four varieties; on one occasion, no less than eight forms of the acid were found in one drop. After the lozenge, the most frequent variety was that of slender half-lozenges deposited upon large spherical masses of lithate of ammonia; then the same upon a large lozenge, disposed very irregularly, giving a vicious, chain-lightning appearance; after these, long delicate needles with beveled ends, elongated tables, and many complicated platforms, all having the lozenge for a basis of construction, were constantly in view.

The lithate of ammonia was in the usual form, rows or networks of minute globules, or collected into opaque masses or enlarged into colourless, flattened spheres of twice or thrice the diameter of blood discs.

During three days the lithic acid assumed the form of red sand,—the crystals being so large that their character could be determined by the eye; at this time the acid amounted to $12\frac{3}{4}$ grains per day, by actual weight.

The chloride of sodium was found some half-dozen times in dagger and crosslet form, but more frequently in large, splendid dodecahedral crystals,

with a beautiful play of colours. Oily globules were occasionally spread over the field and collected in a band around the border; many hair-like fibres were also repeatedly noticed.

This period, extending from July 6 to August 1, when the patient left the city, gave the following results: Average quantity of urine ℥28·28; specific gravity 1·02714; solid contents grs. 951·87.

From August 2 to August 20, while in the country, the averages were, specific gravity 1·01704; quantity of urine ℥36·8; solid contents grs. 802·123.

On the return to the city, and for two or three days previously, the patient was subject to great fatigue, heat, and loss of sleep. The system was deranged, and all that had been gained, seemed lost. The urine was high-coloured, burning the urethra in passing, varying in specific gravity from 1·025 to 1·049; the renal pain returned, and was very severe, and a dull, worrying pain, at times very sharp, appeared behind the pubes. There was urgent thirst; the tongue, clean at the tip and margin, was furred in the middle; bowels costive, great vigilance was present, and the weight fell rapidly to 120 lbs. From eating unripe fruit, an attack of diarrhœa came on, which lasted three or four days; this was followed by a period of rest.

The specific gravity mounted, during this period, to 1·02575 average. The quantity of urine was ℥xxxv. The solids had increased to 897·855 grs. The pulse was very variable, ranging from 50 to 70 in the morning before rising, and from 55 to 70 at night.

After resting a few days, and observing the same course of treatment as before, with moderate exercise after breakfast, a diminution of every symptom took place, which went on rapidly towards a state of health, until the last of September, when all treatment was laid aside. The pulse (Oct. 1) was natural, ranging from 48 to 63. The deposit, whenever it occurred, which was seldom, was in urine passed from three to four hours after dinner, the specific gravity about 1·022, quantity about ℥xxxv. During the last period of treatment, the quantity was ℥xxx, mean specific gravity 1·02347, average solid contents 870·068 grs.

Several points of interest occurred in this case, one of which was the rapid changing of the specific gravity in the course of a single day, *e. g.*, June 23, before dinner, ℥viiss, 1·035; after dinner, ℥ivss, 1·022; at bed-time, ℥vj, 1·043. Aug. 23, 4 P. M., a pale turbid specimen of ℥ix¼, specific gravity 1·008; in the evening, ℥iv¼, clear, high coloured; specific gravity 1·0221. Aug. 28, before breakfast, ℥xiij; specific gravity 1·030; two hours afterward, ℥ij; specific gravity 1·021; three hours later, ℥xiv; specific gravity 1·005.

The specific gravity, although depending, in a great measure, on the quantity of urine, would sometimes maintain its height, even when the amount of urine was large, obeying a law of increment and decrease through the day, rather than that of concentration and dilution; for, during each day, a regular fall and rise were observed, the course being as follows: —from the morning density it fell after breakfast, rose at noon, but not to the height of the morning; fell to its lowest point about 4 P. M.; then rose gradually till midnight, falling again a little to the morning; so that, where the afternoon quantity was small, and of low density, it would still rise in the night urine, although the quantity might be very large.

Another point of interest was the appearance of diarrhœa at the end of the oxalic period, and also at the end of the period in which travelling had disturbed the system, after which the case proceeded to a cure.

The disappearance of the oxalate of lime in the one case, and the immediate improvement and cure following the second, would indicate that catharsis, produced by sulphate magnesia, or other saline purgatives, might likewise produce a crisis which would be followed by health.

Another interesting observation was the effect of coffee upon the crystals of lithic acid. When taken at breakfast, whatever the type of crystals had been the previous night, or in the morning urine, that passed about noon, or from four to six hours after the coffee, the crystals assumed the ragged half lozenge on a mass of lithate of ammonia. It also had the effect of increasing the quantity of hair-like fibres, to such a degree, that sometimes the specimen appeared as if it had been exposed to a dusty room, and in such case the hairs were studded by the crystals like rock candy on a string. A glass of whisky punch, drank when the case was near its termination, rendered the urine turbid, giving copious deposits throughout the following day.

From this case, with its treatment, I am led to infer that the shortest method of putting an end to the deposition of the triple phosphates, is to cut off at once the supply of material in the food, and to build up the system by tonics, meeting the peculiar symptoms according to circum stances; for, until the diet was made absolutely animal, but little advance was made, and in eight days after a pure animal diet, continuing the tonics, the lithate of ammonia made its appearance, soon, with lithic acid to take the place of the phosphates entirely. A circumstance which occurred about ten days after the disappearance of the phosphates, adds force to the inference; the patient, being strongly tempted, ate three ginger snaps, of not more than half an ounce weight; this (eaten at 11 A. M.) produced a beautiful display of the stellar and winged crystals of the triple phosphates.

After lithic acid, with the lithate of ammonia, has appeared, should they be in excess, sufficient to constitute disease, restore gradually the vegetable diet, continue cold bathing, or the cold douche to the loins, the ammonio-citrate of iron, bitter tonics, a sedative at night, with moderate exercise in the morning. The mind of the patient should be freed from anxiety about his case, and he should not be permitted to learn the particulars of any examination, except in the most general terms. The following table exhibits at a glance the results of the observations:

Period.	Quan. $\frac{z}{3}$.	Sp. gr.	Specific Gravity. Solid conts. Grs.	Before break.	After break.	Before din.	After din.	Night.	Diet.	Deposit.
May 10 to May 22	36	1·0385	1839·084	1·0388	1·0353	1·0377	1 0348	1·04818	no change	triple phosphates.
May 22 to June 25	34·58	1·03426	1379·232	1·032	1·02916	1·03008	1·0277	1 0361	mixed, animal food preponderating	ditto.
June 26 to July 5	25·7	1·0313	1039 009	1·0323	1 0245	1·0285	1·0333	1·0329	pure animal food	lithic acid, oxal. of lime lith. amm.
July 6 to Aug. 1	29·287	1·02714	951·878	1·0264	1·013	1·0255	1·0247	1·0265	mixed	lith. acid, lithate of amm.
Aug. 2 to Aug. 20	36·807	1·01704	802·123	1·0175	1·0143	1·0192	1·0143	1·0214	mixed, principally veget.	" "
Aug. 20 to Sept. 6	35·022	1·0257	897 855	1·0293	1·023	1·0245	1·01575	1·0239	mixed, irregular	" "
Sept. 7 to Sept. 30	30·126	1·0234	870 068	1·0313	1 0233	1·023	1·0229	1·0273	mixed, regular	" "

ART. V.—*On the Influence of Isomorphism in determining the Reactions that take place between Inorganic Compounds, and the Elements of Living Beings.* By JAMES BLAKE, M. D., Professor of Anatomy in the St. Louis University.

THE following memoir contains the results of a series of experiments, that have been undertaken with the view of ascertaining the laws that govern the reactions which take place between inorganic compounds, and the elements of living beings whilst still forming a part of the animal organism. The attention which has of late been bestowed on that interesting field of research, on which the phenomena presented by living beings appear to come into contact and to admit of explanation by the results furnished us in our experiments with inorganic matter, is a sufficient proof that physiologists are beginning to perceive that the branch of science which they cultivate, can no longer be advanced by a mere observance of the phenomena which take place in living beings, but that it is necessary that the torch of experimental investigation should be made to throw its light on the complicated processes going on in the living organism. There can be no doubt, also, that the discoveries which the microscope has revealed to us, must sooner or later meet with their application in solving many of the problems of life; but I am of opinion that of late far too much importance has been attached to this means of research, to the neglect of other paths which are more likely to lead nearer to the point, to the elucidation of which the labours of every physiologist should be directed, viz., the discovery of the laws which govern the reactions that take place in living beings. Although it cannot be denied that morphology must always constitute a most important branch of physiology, and perhaps even, as will be shown in this article, a more important branch than many are inclined to allow, yet we might as well hope to arrive at a knowledge of the properties of an inorganic compound, by studying the forms it assumes, as to attempt to explain the reactions that take place in living beings by simply investigating the form and grouping of their elements. The ready means which the possession of a microscope affords of making its possessor acquainted with new facts, seems to have enlisted all the cultivators of physiology into the ranks of the pure morphologists, and to such an extent has this been carried, that even our elementary treatises on physiology are almost wholly filled by morphological descriptions of the various tissues and fluids, to the neglect of those questions which bear on their chemical properties, and which must certainly exert a more important influence on the phenomena of life. Since the establishment of the law of isomorphism, there is no doubt that a careful investigation of the forms assumed by the different compounds of the same element, will throw much light on its relations to other bodies; but this of itself is not sufficient, and it is only by bringing it into contact with other substances as reagents, that we can arrive at a knowledge of its properties. The same remark will apply to the properties of the different substances which enter into the composition of living beings, for their elements, as well as the elements of inorganic compounds, must be possessed of properties which can only be discovered

by experimentally investigating the relations which take place between them and other forms of matter. The light which chemistry has recently thrown on some of the more interesting points of physiology, clearly points out the direction in which this branch of knowledge must be pursued, even did not a close analysis of the phenomena of life, by showing that they are dependent on certain changes which are constantly taking place in the elements of the body, lead us to study the chemical properties of these elements, in order to arrive at a knowledge of the laws which govern their changes. It is these considerations that have led me to institute a series of experiments, in which I have endeavoured to ascertain, with some degree of accuracy, the properties of the elements of which the living organism is composed, by bringing these elements, whilst still forming part of the living animal, into contact with certain reagents, derived from inorganic compounds. My first experiments were made merely for the sake of observing the phenomena that followed the introduction of certain saline compounds into the blood; but the phenomena that presented themselves were, in some instances, so striking, as to lead me irresistibly to extend my researches much further than I had originally intended; and subsequently the indications of the existence of a new law governing the reaction between the elements of living beings and inorganic compounds, have induced me to carry on these researches so as to comprehend amongst the reagents I have used, compounds of twenty-eight of the simple elements. A moment's reflection on the problems to be solved by such researches, will suffice to show that experiments conducted with this class of substances, are more likely to furnish us with useful results, than those made with bodies derived from the vegetable or animal kingdom; although, by the striking effects produced by some of these substances on the animal economy, physiologists have mostly directed their attention to the reactions produced by them on the living body. By such a course of proceeding, however, we are employing reagents, with the composition and properties of which we are but imperfectly acquainted, to the neglect of those on the nature and properties of which chemistry has already thrown much light; for not only are we better acquainted with the more purely chemical properties of inorganic compounds, but their relation to heat, electricity and molecular polarity, has been, to a considerable extent, made out. The manner in which I have performed these experiments, has been to introduce a solution of the substance experimented with, into the veins or arteries of a living animal. The preparation necessary to do this, is not of a nature to disturb, to any extent, the functions of any organ; for it requires merely the introduction of a tube into a vein or artery. In most instances, the substances were introduced into the jugular vein; they then are brought into contact with the right cavities of the heart, thence with the pulmonary tissues, and the left cavities of the heart, whence they are circulated through the whole system. The phenomena principally observed, were those connected with the more important functions of the animal economy, as respiration, circulation, and the functions of the nervous system, and it has been principally, as regards these functions, that they have been noted.

The hemadynamometer has, by its use, greatly added to the facility and certainty of detecting any changes which take place in the circulation, and has revealed many interesting facts which must otherwise have escaped observation. If, for instance, a substance that had been in-

troduced into the blood gives rise to an obstruction in its passage through the pulmonary capillaries, this is instantly shown by the descent of the mercury in the instrument; for the supply of blood which reaches the left side of the heart, and the arteries, being cut off, the pressure of the blood in the arterial system is necessarily diminished, and this will take place in four or five seconds after the injection of the substance into the jugular vein. But if the substance used passes through the capillaries of the lungs, the next point at which we can trace any signs of its action is when it circulates over the parietes of the heart, or when it arrives at the capillary terminations of the coronary arteries. Should the reagent be of a nature to destroy the irritability of the heart, its motions are found to be arrested in from seven to ten seconds after it has been introduced into the vein; in this case, the pressure in the arterial system suddenly falls, and no oscillations are visible in the column of mercury. Should even the slightest change be produced in the action of the heart, by the passage of any substance over its parietes, this would be instantly indicated by a modification of the pressure in the arterial system. Should any effect be produced on the passage of the blood through the systemic capillaries, the pressure in the arteries instantly becomes increased if the systemic capillary circulation be obstructed, and diminished if the passage of the blood through these vessels is facilitated.

The effects produced upon the functions of the nervous system, and on respiration, are readily observed. In some cases in which a substance is arrested by the pulmonary capillaries, or when it suddenly stops the action of the heart, it is necessary to introduce it into the arterial system, in order to ascertain its effects on the brain and spinal cord.

In stating the facts that have been observed in these experiments, I shall not attempt to enter into details of the phenomena which characterize the action of each substance, but shall endeavour to present them in a tabular form, arranging the phenomena observed under the different heads before alluded to as connected with the modifications produced in the more important functions. I am aware that such a mode of bringing forward the facts I have to relate, must be attended with the inconvenience of omitting many details which it might be desirable to bring forward; but this I consider will be compensated by the facility it offers of comparing the effects of the various substances used. The arrangement I have followed in drawing up this table is not such as would be suggested by a consideration of the chemical properties of the substances employed, but is based on their physiological action, as ascertained by direct experiment. By the side of each substance experimented with, will be found the quantity generally required to arrest the action of the heart.

N. B. All the experiments were performed on dogs.

Substance experimented with, and the quantity required to arrest the action of the heart.	Action on the heart.	Effects on the nervous system.
1. Ammonia. Liquor ammonia, f. ʒss. Hydrochlorate ammonia, ʒiss a ʒij. Nitrate ammonia, ʒiss a ʒij.	In small quantities they quicken the action of the heart, in larger doses they totally destroy it. Injected into the arteries, the action of the heart is arrested before respiratory movements cease.	Give rise to spasms resembling those produced by strychnia. Injected into the arteries, give rise to general spasm, and in very strong doses will arrest the respiratory movements before the action of the heart ceases.
2. Potassa and its salts. Caustic potassa 3 grs. Nitrate " 5 grs. Arseniate " 8 grs. Carbonate " 12 to 15 grs.	Resemble exactly the salts of ammonia.	Action on the nervous system not so marked as is the case with the salts of ammonia. Same phenomena follow their introduction into the arteries.
3. Salts of strontia. Nitrate of strontia, ʒss a ʒij, Chloride " ʒss a ʒij.	Heart's action rendered slower in about 10 seconds, and it becomes permanently slower and irregular. Irritability destroyed by larger doses; the ventricles appear to be more affected than the auricles.	No effects on the nervous system, except that they seem to favour the continuance of respiratory movements after the action of the heart has ceased. Injected into the arteries, even in large doses, they produce no marked effect on the nervous system.
4. Salts of baryta. Nitrate of baryta, 2 grs. Chloride of barium, 2 grs.	The same as the salts of strontia, but producing their effects in much smaller doses, the heart being quite paralyzed by 2 grs. of the salts in 12 seconds.	The same as the salts of strontia. Even when injected into the arteries, respiration continues for two minutes and a-half after the action of the heart has been arrested.
5. Salts of lead. Acetate of lead, Nitrate of lead.	Analogous to the salts of baryta, but the quantity required uncertain. Sometimes the irritability of the heart has been destroyed by 12 grs. of the acetate, in other experiments 3 drachms of the salt have been required to arrest its action.	More marked than with the salts of baryta. Respiration and sensibility continue for some minutes after the circulation has ceased.
6. Salts of silver. Acetate, Nitrate. It is only when the solution of the salt is sufficiently concentrated to produce a marked physical change in the blood, that the irritability of the heart is destroyed. Three or four grains of the salts will kill by their action on the lungs.	In small doses appear to augment the irritability of the heart. Rhythmical contractions continue 10 minutes after respiration has ceased, although death has taken place from asphyxia. In large doses the irritability of the heart is not increased.	Do not appear to exert any marked influence on the functions of the nervous system.
7. Salts of soda. Caustic soda, Chloride of sodium, Nitrate of soda, Carbonate of soda. When as much as three drachms of nitrate of soda have been injected into the veins, none of the functions appear affected, except that of respiration. The animal lived some hours, and died of asphyxia from effusion in the lungs.	Augment the irritability of the heart.	Do not affect the nervous system.

Effects on respiratory organs.	Effects on the capillary circulation.	General remarks.
Not affected.	Impede the passage of the blood through the systemic capillaries.	Neither ammonia nor its salts prevent, in small doses, the coagulation of the blood. Closely resembles some of the organic poisons in its effects on the nervous system, and in this respect differs from all other inorganic compounds.
Not affected.	The same as with the salts of ammonia. Pulmonary circulation not affected.	Coagulation of the blood favoured even by the caustic potassa, unless injected in very large doses, in which case the blood is rendered dark and grumous, as would be the case out of the body.
Respiratory movements always slightly affected immediately after their introduction into the veins; the lungs generally found redder than natural after death.	Passage of the blood through the pulmonary cavities impeded. Systemic capillaries not affected, except when introduced into the arteries, and then but slightly.	Muscular movements continue many minutes after death. The body has been pushed along by the extension of the hind legs; a quarter of an hour after death a *point d'appui* being afforded to the feet.
The same as the salts of strontia.	The same as the salts of strontia. Passage of the blood through the systemic capillaries rather more impeded.	Muscular movements have been observed to continue until forty minutes after death.
Marked effect on the lungs; after death these organs are found congested, and even during life a frothy secretion frequently fills the bronchial tubes and trachea, causing death by asphyxia.	The obstruction to the passage of the blood through the systemic and pulmonary capillaries is much greater than with the salts of baryta.	Muscular movements continue for some time after death. The same phenomenon had been noticed both by Haller and Orfila after the injection of the salts of lead into the veins. Blood coagulates imperfectly.
Lungs always much reddened, and effusion taking place in their tissue. Frothy secretion in the bronchial tubes when injected in small doses.	The passage of the blood through the systemic and pulmonary capillaries very much impeded. Two grains of the acetate injected into the arteries, caused an increase of pressure in the arterial system equal to a column of six inches of mercury.	Blood coagulates imperfectly.
The same as the salts of silver.	The same as the salts of silver.	Blood coagulates imperfectly.

Substance experimented with, and the quantity required to arrest the action of the heart.	Action on the heart.	Effects on the nervous system.
8. Salts of lime. Chloride of lime, 2 drs. Nitrate " 1½ dr.	Heart's action rendered fluttering, then arrested by larger doses.	Slight spasms; powers of movement impaired; sensibility unaffected; vomiting.
9. Salts of magnesia. Sulphate of magnesia, ℥ij.	The same as the salts of lime.	Great prostration of strength; sensibility unimpaired; when injected into the arteries, proves fatal by its action on the nervous system; vomiting always takes place.
10. Salts of iron. Sulphate of iron, 30 to 40 grains.	Heart's action rendered slower by small doses, and then arrested.	Complete prostration; sensibility unaffected; vomiting.
11. Salts of zinc. Sulphate of zinc, 12 to 20 grains.	The same as the salts of iron.	The same as the salts of iron. Prostration noticed by Orfila.
12. Salts of manganese. Sulphate, 12 to 15 grs.	The same as the salts of iron.	The same as the salts of magnesia and iron.
13. Salts of copper. Sulphate, 16 to 20 grs.	The same as the salts of iron.	Prostration not quite so great as with the salts of iron and magnesia.
14. Salts of cadmium. Sulphate, 10 grs.	The same as the salts of zinc.	The same as the salts of magnesia.
15. Salts of nickel. Sulphate, 6 to 10 grs.	The same as the salts of zinc.	The same as the salts of magnesia.
16. Platinum. Chloride, 3 grs.	Heart's action rendered slower, and fluttering; irritability completely destroyed by three grains.	Slight prostration; no vomiting or convulsions. Injected into the arteries, it kills by its action on the nervous system.
17. Palladium. Chloride, 1 gr.	The same as platinum, but more poisonous.	The same as the salts of platinum.
18. Osmium. Double chloride of osmium and potassa, 2 grs.	Heart's action fluttering, not rendered slower.	The same as the salts of platinum.
19. Iridium. Double chloride of iridium and ammonia, 1 grain. (No salts, except the double salts both of iridium and osmium, are soluble in water.)	The same as the salts of platinum.	Prostration apparently from weakness of the circulation, the pressure in the arterial system being not more than equal to two inches of mercury.
20. Phosphorus. Phosphoric acid, a drachm to a drachm and a-half.	No marked effect on the heart, except when in quantities sufficient to change, in a marked degree, the physical properties of the blood.	Functions of the brain not affected; violent pain apparently in the abdomen.
21. Arsenic acid, a drachm to a drachm and a-half.	The same as phosphoric acid.	The same as phosphoric acid. Forty grains of the acid injected into the arteries, did not produce any marked effects on the functions of the brain.

Effects on respiratory organs.	Effects on the capillary circulation.	General remarks.
Slight spasmodic action of respiratory muscles.	Neither the systemic nor pulmonary capillary circulation affected.	Slight quivering of the muscles after death.
Slight dyspnœa.	The same as lime.	Blood coagulates.
Slight dyspnœa.	Appear to facilitate the passage of the blood through the systemic capillaries.	Blood remains quite fluid after death, so as to allow the complete subsidence of the red particles.
Slight dyspnœa.	The same as the salts of iron.	The action on the blood is the same as that of the salts of iron.
Slight dyspnœa.	The same as the salts of iron.	Blood did not coagulate.
Slight dyspnœa.	The same as the salts of iron.	The blood coagulates imperfectly; irritability of the voluntary muscles diminishes after death.
No effect.	The same as the salts of iron.	Blood remains fluid after death.
No effect.	The same as the salts of iron.	Blood remains fluid after death.
Respiration rendered intermittent in a marked degree; sometimes altogether suspended for one or two minutes, and then recommences, and this may take place many times. Lungs contain but very little blood after death.	Impedes the passage of the blood through the systemic capillaries. Pulmonary circulation not affected.	Slight muscular movements after death; blood apparently much affected, coagulates very imperfectly, and always of a dark maroon colour in the left cavities of the heart, although the action of the heart ceases before the respiratory movements.
The same as the salts of platinum. Lungs always anæmic after death.	Passage of the blood through the systemic capillaries much impeded, the pressure in the arterial system not diminishing until some minutes after the heart has ceased beating.	Action on the blood the same as the salts of platinum. The physical change produced in the blood is very great, considering the smallness of the quantity of the salt.
The same as the salts of platinum.	Systemic capillaries affected even when the salt is introduced into the veins.	Blood arterialized and coagulates. (I think the presence of potash in this salt cloaks the action of the osmium.)
Respiration intermittent; lungs anæmic.	Impedes the passage of the blood through the systemic capillaries when injected into the arteries.	The same action on the blood as the salts of platinum.
Dyspnœa; secretion of froth in the bronchi; lungs hepatized.	Obstructs the capillary circulation in the lungs.	Intestinal mucous membrane reddened. The blood has been found alkaline after as much as a drachm of glacial phosphoric acid had been injected into the veins; coagulation of the blood imperfect.
The same as phosphoric acid. Hepatization often partial; has been observed on three occasions to be confined to the left lobes.	Its action on the pulmonary capillaries does not appear to be quite so great as that of phosphoric acid.	The same action on the mucous membranes and on the blood as phosphoric acid.

Substance experimented with, and the quantity required to arrest the action of the heart.	Action on the heart.	Effects on the nervous system.
22. Arsenious acid.	Does not destroy the irritability of the heart even in a concentrated solution.	The same as arsenic and phosphoric acids.
23. Antimony. Tartrate, 40 grains.	The same as phosphoric acid.	Violent pain in the abdomen; voluntary movements slightly affected; no vomiting.
24. Sulphur. Sulphuric acid.	Increases the irritability of the heart.	Slight convulsions; no expression of pain.
25. Selenium. Selenic acid.	The same as sulphuric acid.	Movements of a spasmodic character, resembling chorea. Injected into the arteries, it kills by its action on the nervous system.
26. Chloric acid. 27. Hydrochloric acid. 28. Bromic acid. 29. Iodic acid. 30. Hydriodic acid. These substances so closely resemble each other in their action, that I consider it unnecessary to notice each separately. The quantity of the strong acids required to destroy life is, for the Chloric acid, 20 drops. Hydrochloric, 10 drops. Bromic acid, 10 grs. Iodic acid, 15 grs. Hydriodic acid, (sp. gr. 1.12) 3 drachms.	Increase in a marked degree the irritability of the ventricles, but they seem to weaken the irritability of the auricles. The ventricles continue irritable many minutes (10 to 20) after mechanical stimuli have ceased to affect the auricles; circulation will continue many minutes after respiration has ceased, even more vigorously than during life. The pressure in the arterial system has been found equal to a column of mercury of seven inches, eight or ten minutes after respiration had ceased, and, even when the pressure has sunk to two inches, it will again rise to five or six; the heart apparently receiving a fresh stimulus, although the animal has been, to all appearance, dead for some minutes.	Destroy the functions of the nervous system, particularly when injected into the arteries.

NOTE.—Having ascertained that all the salts of the same base produce analogous effects gated the action of one of the salts of each base.

A very superficial analysis of the results brought forward in the above table, will suffice to show how very different are the reactions which take place between the elements of living beings and these organic compounds, from those which we might have expected to be produced, from a consideration of the ordinary chemical properties of the re-agents employed. If, for example, we consider the action of some of these substances on the irritability of the heart, we find that by one powerful alkali (potash), it is suddenly destroyed; whilst by another (soda), it is increased; by some acids (the phosphoric and arsenic), it is deadened; by another class (the chloric), it is augmented in a remarkable degree; a strong caustic base (soda) augments it, whilst a comparatively chemically inert salt (the chloride of palladium), even in very small quantities, destroys it. A few grains of nitrate of potash arrest its movements in a few seconds, whilst more than twice the quantity of nitrate of silver only seems to increase its irritability. As regards the passage of the blood through the pulmonary

Effects on respiratory organs.	Effects on the capillary circulation.	General remarks.
The same as arsenic acid. The immediate cause of death would appear to be owing to its action on the pulmonary tissue.	The same as arsenic acid.	The same as arsenic acid.
The same as arsenious acid, but respiration rendered more irregular, *entre coupé*.	The same as arsenic acid.	Effects on gastro-intestinal mucous membrane, and on the blood, the same as those of arsenic acid.
Dyspnœa; secretion of fluid in the air passages; lungs hepatized.	The same as phosphoric acid.	Blood coagulates firmly.
The same as sulphuric acid.	The same as sulphuric acid.	Blood coagulates firmly.
The same as sulphuric acid.	Cause obstruction to the passage of the blood through the systemic and pulmonary capillaries.	The blood coagulates firmly.

when introduced into the blood, I have, in most instances, only experimentally investi-

capillaries, this certainly seems impeded by all acids; but we find that the same effect is produced by soda, and the salts of silver and lead. If, again, we consider the phenomena in connection with the supposed physiological action of the substance, we shall find quite as striking examples of the want of agreement between our preconceived notions, and the facts observed. We see an astringent substance (sulphate of iron), facilitating the passage of the blood through the capillaries, and preventing its coagulation, whilst an alkali (potash), causes the blood to coagulate more firmly, and at the same time affords an obstacle to its passage through the capillaries. We find arsenic exerting no marked effect on the tissues, even when injected in large quantities, whilst a much smaller quantity of carbonate of potash is rapidly fatal; we find the same substances (the salts of baryta), destroying the irritability of the heart, whilst they increase that of the voluntary muscles in a great degree (*this fact had been noticed by Haller, as regards the salts of lead*). Did these experiments only show the necessity of modi-

fying our notions, derived from the common properties of bodies, when we come to consider their action in the living organism, they would be of some use in clearing away many false views, which must exert an injurious influence on the study of physiological chemistry. But the results they furnish are not simply of a negative character; they do not merely prove that the reactions which take place in the living animal are not to be explained by the common chemical properties of matter,—but they point out a new law, which shows, that, under these circumstances, in which the ordinary properties appear to lose their application, a new and a more latent property of matter comes into play, and exerts its influence over a most extensive series of phenomena. A superficial view of the order in which the various substances experimented with, are arranged in the above tables, shows that they divide themselves into groups, each of which is distinguished by reactions not to be found in any other class. Thus we find potash and ammonia, agreeing very closely in the phenomena they give rise to; again we have strontia, baryta, and lead, all producing reactions nearly resembling each other, and all characterized by their influences on the muscular system. Soda and silver also agree very closely in the phenomena to which they give rise.

We then find a very large family of substances, including lime, magnesia, zinc, iron, copper, manganese, nickel and cadmium, all producing effects which resemble each other, and distinguished from all other bodies by their action on the nervous system.

Platinum, palladium, iridium and osmium, readily arrange themselves in a distinct class, agreeing as they do with each other in most of their reactions; another well-marked group is formed by phosphorus, arsenic and antimony. Selenium and sulphur are found closely to resemble each other in their reactions on the living organism; and between the remaining elements, chlorine, iodine and bromine, the most striking analogy exists in their physiological action.

The classes thus formed will be found to agree with those which are adopted by chemists in their arrangement of the different elements, according to their isomorphous relations, and the only conclusion to be derived from this interesting coincidence is, *that the physiological action of these substances depends upon some property they possess in connection with these isomorphous relations.*

The evidence on which this law is founded, will, I trust, be sufficient to ensure its reception. It has been arrived at by an experimental investigation of the physiological action of the compounds of the elements forming all the well-marked isomorphous groups, and in no instance has there been found an exception to it, for the apparent exception which has presented itself by the separation of soda and silver from the potash group, I conceive to be owing to these substances having been united into one group on insufficient grounds; for, whilst the isomorphous relations between soda and silver are well-marked, and also between potash and ammonia, it still admits of doubt, whether any well-marked relations exist between the two first and the two last substances.

But independently of the facts which the above experiments directly furnish of the existence of such a law, there are some collateral considerations which would add weight to the evidence they afford. It will be seen, on referring to the table, that the substances which appear to exert the least injurious effect, or to produce the slightest change in the animal economy, when introduced directly into the blood, are those which either exist in the body as constituents of some of its fluids or solids, or which have isomor-

phous relations with some of these; whilst, on the other hand, it will be found that those substances which have no isomorphous relations with the elements of the body, are those which are most fatal. The slight effects of arsenic and nitrate of silver, when injected into the veins, afford an example of the first proposition, whilst the very poisonous effects of palladium and baryta are instances of the last. It also appears to me interesting, under this point of view, that silver seems to possess the property of entering into the composition of the animal tissues, without destroying their vitality, or interfering with their functions; now this substance is isomorphous with soda, and I think it highly probable that it replaces it as an element in the composition of the tissues, in cases of coloration of the skin by the use of nitrate of silver. A consideration of the important part which form seems to exert in the phenomena of living beings, might lead us to expect that if, in the reactions that take place between their elements and inorganic compounds, any other property of matter should take a part different from its ordinary chemical properties, this might be a property connected with the form which even these inorganic elements have a tendency to assume. In the present imperfect state of our knowledge as regards isomorphism, it would be useless to speculate on what property connected with these relations, their physiological action depends; whether it is, for instance, through their relations to heat, or to electricity, or from analogy in their specific volumes, that we find isomorphous substances producing the same effects in the animal economy, or whether these effects are connected simply with the property which these substances have of assuming the same form. I think there is every probability that the law which governs the actions between inorganic elements and the elements of the blood and tissues, will be found to prevail in the reactions that are taking place between the different elements of the animal organism.

Having thus deduced the general law which appears to govern the reactions in which the elements of the living body, and these inorganic compounds, are concerned, I shall offer a few remarks on some of the more purely physiological phenomena that I have recorded in the above tables. If we investigate the facts connected with the modifications of the irritability of the heart, it will be seen that the greater number of the metallic salts appear to agree in destroying it; but to this the salts of silver form a marked exception: the alkaline bases and their salts (soda and potash), exert directly opposite reactions on its irritability, the one class increasing it, the other proving fatal to it. Of the earths, we find baryta acting as a powerful poison to it, whilst lime, except in large doses, exerts but slight influence over it.

The greater part of the acids evidently increase the irritability of the heart, but we are not justified in ascribing this to their properties as acids, when we find the phosphoric and arsenic deaden it, and, on the other hand, that it is increased by soda.*

If we compare the action which these substances exert on the heart,

* The action of the chlorine group of acids on the heart is very remarkable, for by their presence in the blood, they seem to supply, to a great extent, that stimulus which the oxygenation of the blood usually affords. This cannot be owing to the oxygen they contain, for the hydracids of these elements produce the same effects. In twenty experiments that have been performed with this class of substances, I have always found the irritability of the auricles to be diminished in a marked degree, whilst that of the ventricles is even to a more striking extent augmented; the ventricles are generally found beating rhythmically some minutes after the auricles have ceased to contract, and even after they are insensible to mechanical stimuli.

with their effects on the functions of the nervous system, we find that, in some instances in which the whole of the functions of the nervous system are suddenly annihilated, the irritability of the heart is much increased. On the other hand, we find substances which increase the action of the heart, exerting no perceptible action on the functions of the nervous system, whilst in other cases, they exert a deleterious influence on it. If we compare the action of these substances on the blood with their effects on the heart, we still find the same anomalies; those substances which favour the coagulation of the blood, in some instances increasing the irritability of the heart, in other instances destroying it, whilst by those substances which prevent the coagulation of the blood, we find the same opposite effects produced. These observations will show how little the action of these inorganic compounds on the heart is connected with their ordinary chemical properties: but there are one or two anomalies which present themselves when we consider the action of these compounds on the heart, in connection with their isomorphous relations;—for instance, there exists a great difference in the relative poisonous effects of the salts of baryta and those of strontia, two substances closely related as regards their isomorphous properties. Were these substances to be classed according to their action on the heart, we might be inclined to place the salts of strontia nearer to the salts of lime than to those of baryta; but here the action which the salts of strontia exercise on the general muscular tissue, refers it at once to the baryta group. There is also a great difference in the quantities required of the salts of magnesia, and those of nickel and cadmium, in order to destroy the irritability of the heart; but the difference is found only as regards the quantity, their action on the heart being perfectly analogous, and also the effects they produce on the nervous centres.

If we turn our attention to the phenomena recorded in the second column of the above tables, we find the same want of agreement between the physiological action of these substances, and their chemical action. Sometimes it is by an acid, sometimes by an alkali, that we find the functions of the nervous system destroyed; in some cases we see that considerable quantities of what are considered the most powerful poisons, can be brought into contact with the brain, without producing any marked symptom, whilst small quantities of some of the neutral salts are extremely fatal to it. The well-marked analogy that exists between the action of the whole of the magnesian class on the nervous system, although including bodies which differ so widely in their chemical and physical properties, affords a striking confirmation of the connection of the action of these substances with their isomorphous relations. As regards the general action of these inorganic substances on the nervous system, I find they differ from the poisons derived from the vegetable kingdom. The only substance amongst them whose action at all resembles that of the vegetable poisons, is ammonia—a substance which appears to form the link between organic and inorganic compounds, and which (or at least some compound of nitrogen, according to a remark of Liebig), enters into the composition of all vegetable poisons. The action of this substance offers the only anomaly as regards the classification of these substances, from their effects on the nervous system, according to their isomorphous relations. There are certain sources of fallacy which, in these experiments, may interfere with our appreciating with exactness the direct action of these substances on the nervous system, particularly the derangements that many of them produce in the circulation through the pulmonary and systemic capillaries. From both of these causes the brain becomes subject to increased pressure,

in the one case from venous congestion, and in the other from the accumulation of blood in the arterial system; the pressure caused by the obstruction of the pulmonary circulation, occurring, as it does, in the vein, seems to be much more injurious than when a far greater amount of pressure is supported by the arteries. I have seen the functions of the nervous system but little affected by a pressure in the arteries equal to ten inches of mercury, whilst in the venous system the pressure of an inch and a half, or two inches, is sufficient to arrest the functions of the nervous system. There is one fact in relation to the action of those substances on the nervous system which is worthy of note, viz., that nearly all those bodies which agree in producing great prostration, also agree in preventing the coagulation of the blood. In the action of these substances on the lungs, we find, as has already been remarked, some facts that might attach the phenomena observed to their ordinary chemical properties, for we see that all the acids act in the same way on the pulmonary tissue, or at least, that they give rise to the same changes in the lungs. But again, we see soda, and the salts of silver and lead, exerting the same influence. A closer connection appears to exist between the action of those substances on the lungs, and their influence in maintaining the irritability of the heart; in fact, most of them increase it, whilst all the substances which destroy its irritability, appear to pass through the lungs without affecting them. The only exception, furnished by the action of these bodies on the lungs, to the law which connects their physiological action with their isomorphous relations, is found in the action of the salts of lead, which agree with the salts of silver in the effects they produce on the pulmonary tissue. The effects produced upon the capillary circulation, both pulmonary and systemic, are capable of being observed with considerable accuracy. I have already remarked, that we find all the acids producing an impediment to the passage of the blood through the pulmonary capillaries, and some of these substances exert the same action on the systemic capillaries; whilst others, although they evidently impede the pulmonary circulation, pass through the systemic capillaries without producing the slightest obstruction.

We also find that many substances that pass readily through the capillaries of the lungs, cause great obstruction in the systemic capillaries. I am inclined to think that there are some substances that even facilitate the passage of the blood through the capillaries, although it is difficult to obtain any positive proof of this; nor am I able to state whether these bodies cause obstruction in the capillaries, owing to their rendering the blood physically incapable of passing through them, or whether the obstacle is caused by the contraction of the capillaries themselves.

The only class of facts that now remains to be noticed, are those that relate to the action of these substances on the blood, as ascertained by its more obvious physical characters. It might have been expected that, under this point of view, we should have found a close connection existing between the physical and chemical properties of the reagents employed, and the effects they produced; but such is not the case: for in no other class of phenomena do we find these substances acting so completely in accordance with their isomorphous relations.

The only exceptions observed are, that neither the salts of magnesia nor the salts of lime prevent the coagulation of the blood, although all the other members of the magnesian family produce this effect. The salts of lead also differ from those of baryta, in maintaining the blood fluid, and afford, in this respect, another instance of their analogy with the salts of soda and

silver. The fact which I have noticed, of the alkaline reaction of the blood after as much as a drachm of glacial phosphoric acid had been injected into the veins, affords a striking instance of the manner in which the chemical properties of a substance may be masked or changed when brought into contact with the living fluids and solids.

The action of the baryta group on the muscles of animal life, is in curious contrast with their action on the heart, the irritability of which they completely destroy, whilst the voluntary muscles continue contracting for many minutes after death.

It seems, from the foregoing observations, that, independently of the interest that many of the facts recorded may possess, in a physiological point of view, a closer analysis of the action of those substances on the different organs of the body, and on the blood, affords additional proof of the existence of the law connecting the physiological action of these inorganic compounds with their isomorphous relations. Considering the imperfect state of our knowledge as regards the isomorphous relations of the elements, it is surprising that more exceptions to this law have not presented themselves in so extended a series of experiments; and I have but little doubt, that those which have been remarked, will disappear before a more perfect knowledge of the molecular properties of matter, on which, I think, physiological experiments are destined to throw light.

ART. VI.—*An Analysis of the Cases of Delirium Tremens, admitted into the Bloomingdale Asylum for the Insane, from June 16th, 1821, to December 31st, 1844.* By PLINY EARLE, M.D., present Physician to the Asylum.

DURING the whole period of its existence, the Bloomingdale Asylum has been made the receptacle, not for cases of insanity proper, alone, but also for persons labouring under delirium tremens, as well as for some, who, although not attacked with this disease, were addicted to the habitual and excessive use of intoxicating liquors. These persons are not, strictly speaking, proper subjects for an asylum for the insane; but as there is no institution in the vicinity of New York particularly devoted to them, and no other place so well adapted to their treatment and temporary seclusion from the source of their disorder, this establishment almost necessarily became, in the hope of a reformation, their place of refuge.

The aggregate number of *cases* of this kind, admitted previously to the 31st December, 1844, is 594; of which 511 were males, and 83 females. But this number includes many readmissions of the same individuals. In the subjoined table these cases are arranged according to their several admissions and readmissions.

	Males.	Females.	Total.		Males.	Females.	Total.
First admission,	274	48	322	Ninth admission,	5	0	5
Second "	85	17	102	Tenth "	5	0	5
Third "	42	7	49	Eleventh "	5	0	5
Fourth "	29	4	33	Twelfth "	3	0	3
Fifth "	20	3	23	Thirteenth "	2	0	2
Sixth "	14	2	16	Fourteenth "	2	0	2
Seventh "	8	2	10	From 15th to 26th,			
Eighth "	5	0	5	each one admission,	12	0	12
				Total	511	83	594

Thus, the whole number of *persons* was 322. To these, and to their disease on their first admission, our investigations must for the present be confined. The years in which they were respectively first admitted, are indicated in the following table.

	Males.	Females.	Total.		Males.	Females.	Total.
1821	14		14	1833	17	1	18
1822	19	3	22	1834	11	1	12
1823	14	4	18	1835	5	3	8
1824	17		17	1836	12	1	13
1825	24	3	27	1837	13	1	14
1826	20	5	25	1838	9	6	15
1827	14	5	19	1839	4	1	5
1828	11	2	13	1840	5	2	7
1829	12		12	1841	6	1	7
1830	9	4	13	1842	2	2	4
1831	14	1	15	1843	4	1	5
1832	12	1	13	1844	6		6
				Total	274	48	322

In the earlier years of the institution, as will be perceived by this schedule, there were many more victims to intemperance received, than at a later period, although the population of the city, the principal source of these patients, was more than doubled during the series of years embraced in these statistics. This fact may undoubtedly be in part attributed to the improved habits of the community, resulting from the interest awakened in the cause of temperance.

The sexes being distinguished in the foregoing table, it will be perceived that there were 274 males and 48 females; the former exceeding the latter in the proportion of nearly six to one.

Of these 322 patients, the countries of nativity of 273, and those of residence, at the time of admission, of 295, are recorded. They are as follows:

Nativity.								Residence.			
State.	M.	F.	T.	Country.	M.	F.	T.	State or County.	M.	F.	T.
New York	137	15	152	Ireland	32	13	45	N. York	237	39	276
Connecticut	10	1	11	England	14	6	20	N. Jersey	6	0	6
New Jersey	9	0	9	Scotland	7	1	8	Massachusetts	4	0	4
Massachusetts	7	1	8	France	2	1	3	Connecticut	3	0	3
Pennsylvania	2	1	3	Nova Scotia	1	1	2	Pennsylvania	0	1	1
Maryland	2	0	2	Wales	1	0	1	Virginia	0	1	1
Virginia	2	0	2	Germany	1	0	1	Louisiana	1	0	1
Maine	2	0	2	Sweden	1	0	1	Michigan	1	0	1
N. Hampshire	0	1	1					Canada	1	0	1
Rhode Island	1	0	1	Tot. Foreigners	59	22	81	Dist. of Columbia	0	1	1
S. Carolina	0	1	1								
				Total U. States	172	20	192	Total	253	42	295
Total U. States	172	20	192								
				Aggregate	231	42	273				

It appears that 152, or 55 per cent., of the whole, were born in the State of New York; and 40, or 14 per cent., were natives of other States of the Union. Of foreigners there were 81, which is equal to 30 per cent.

Persons labouring under delirium tremens are rarely carried to a great distance for treatment. This is rendered inconvenient, and generally impossible, both by the condition of the patient, and the duration of the disease.

Hence it is not surprising that, of 295 individuals admitted, no less than 276 resided in this state, and a very large proportion of these in the city of

New York. Of the 19, whose residence was in other States and in Canada, several were sojourning in this city when attacked with the disorder for the cure of which they were brought to the Asylum.

The profession or occupation of 238 men is exhibited in the subjoined list. An attempt has been made to classify them according to the peculiar nature of their several employments.

1. *Mercantile.*		7. *Active employment within doors.*	
Merchants and Traders,	50	Brush maker,	1
Clerks,	25	Comb maker,	1
Druggists,	3	Leather dressers,	5
Manufacturers,	2	Carpenter,	1
2. *Professional.*		Cooper,	1
Physicians,	2	Chair makers,	2
Medical Students,	2	Collector of Taxes,	1
Lawyers,	19	Clothier,	1
Student of Law,	1	Silk printer,	1
Artist,	1	Book binder,	1
Architect,	1	Nail maker,	1
3. *Dealers in Liquor.*		Gilder,	1
Tavern Keepers,	3	Actor,	1
Grocers,	14	Printer,	1
Brewer,	1	Silversmith,	1
4. *Mariners.*		Coppersmith,	1
Naval Officers,	2	Upholsterer,	1
Sailors,	11	Circus rider,	1
Sea Captains,	3	8. *Active employment out of doors.*	
Pilot,	1	Farmers,	8
5. *Exposed to Heat.*		Laborers,	6
Iron-founder,	1	Cartmen,	3
Blacksmiths,	2	Pavier,	1
Engineer,	1	Painters,	2
Glass-blower,	1	Masons,	4
Bakers,	3	Butchers,	3
Hatter,	1	Peddlers,	2
6. *Sedentary.*		Cider maker,	1
Sail maker,	1	Stage driver,	1
Shoe makers,	2	Soldier,	1
Watch maker,	1	Musician,	1
Tailors,	4	9. *No Occupation.*	
Saddler,	1	Men of leisure, and young men without employment,	23
Carpet weaver,	1		

Merchants, traders, clerks, professional men, persons of leisure, and young men without employment, furnish 129, or 10 more than one-half of the 238 patients here recorded. Without explanation, the necessary inference must be far from flattering to these classes. It must be recollected, however, that they constitute no unimportant proportion of the population of the commercial and wealthy city of New York. They are, moreover, those classes, the members of which, more generally than those of other portions of the population, resort to this institution when thus diseased. The great majority of persons whose pecuniary resources are limited, are taken to places where the expenses are less.

Table showing the Ages of 254 Patients.

Sex.	Under 20 years.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	Total.
Males,	3	77	81	36	10	5	212
Females,	0	8	19	7	6	2	42
	3	85	100	43	16	7	254

The decennium in which there was the greatest number, is that from 30 to 40 years. The next is that from 20 to 30; and the third, that from 40 to 50.

In the community at large, there is a much greater number of persons between 20 and 30 years of age, than in any decennium of more advanced life. Hence the proportionate number of these patients between 30 and 40 years, as compared with the living population of the corresponding age, is much greater than that in any other period of existence.

The civil or social condition of 286 patients is indicated by the following table:—

Condition.	Males.	Females.	Total.
Single,	122	1	123
Married,	115	37	152
Widowed,	4	7	11
Total	241	45	286

The number of unmarried men exceeds that of the married by seven; although, if the widowed be included with the latter division, the single predominate over the married by but *three.*

This approximation to equality of numbers in the classes of celibacy and matrimony, though so strikingly remarkable with the men, does not obtain with the women. Of the latter sex, the married exceed the unmarried in the proportion of thirty-seven to one; or, if the widowed be included with the married, in the proportion of forty-four to one.

Result of Treatment.

Condition.	Males.	Females.	Total.
Cured,	244	42	286
Much improved,	1	0	1
Improved,	0	3	3
Relieved,	1	0	1
Unimproved,	5	2	7
Eloped,	2	0	2
Died,	19	1	20
Remain,	2	0	2
Total	274	48	322

As a general rule, delirium tremens soon terminates either in recovery or death.

Considering the severity of the disease, it is imminently curable. Thus, of 322 patients, 286 were cured, and but 20 died. The two still remaining in the house are also cured.

It is proper to remark, as has already been intimated, that, in some of these cases, the patient had no delirium while at the Asylum. Among them were a few in each of the various conditions and phases, both temporary and more prolonged, of intoxication.

The rapidity with which the delirium approaches its crisis, in fatal cases, is well illustrated by the following table, indicating the term of residence at the Asylum of each patient who died.

Time in Asylum.	M.	F.	Total.	Time in Asylum.	M.	F.	Total.
1 day	2	0	2	Brought up	14	1	15
2 days	2	1	3	10 days	1	0	1
3 "	2	0	2	12 "	1	0	1
4 "	5	0	5	13 "	1	0	1
5 "	1	0	1	27 "	1	0	1
7 "	1	0	1	1 month 22 "	1	0	1
9 "	1	0	1				
Carried up	14	1	15	Total	19	1	20

In 12 of these 20 cases, the patient died within 4 days from the time of his reception into the asylum; and all of them, excepting one. within 27 days. The man who remained one month and 22 days, died of congestive fever.

The death of the man who died on the ninth day, was the result of an attempt at suicide, by cutting his throat, before admission. This was also the case with one of the men who died on the fourth day. One of the men committed suicide while in the asylum.

Re-admissions.

Second Admissions.—Of the 322 persons before mentioned, 85 males and 17 females, a total of 102, were admitted a second time, and discharged as follows:

	Males.	Females.	Total.		Males.	Females.	Total.
Cured	74	15	89	Brought up	82	17	99
Much improved	1	0	1	Died	1	0	1
Improved	2	0	2	By Habeas Corpus	1	0	1
Unimproved	3	2	5	Not stated	1	0	1
Eloped	2	0	2				
Carried up	82	17	99	Total	85	17	102

Third Admissions.—42 males and 7 females, making an aggregate of 49, were each admitted a third time. They were discharged as follows:—

	Males.	Females.	Total.
Cured	36	6	42
Improved	3	1	4
Unimproved	1	0	1
Eloped	1	0	1
Died	1	0	1
Total	42	7	49

Fourth Admissions.—Of the fourth admissions there are 33; of whom 29 are males, and 4 females, who left the asylum as follows:

	Males.	Females.	Total.
Cured	21	4	25
Improved	1	0	1
Unimproved	3	0	3
Eloped	3	0	3
Died	1	0	1
Total	29	4	33

Fifth Admissions.—23 were received a fifth time each. Of these, 20 were males and three females. Discharged as follows:

	Males.	Females.	Total.
Cured	16	3	19
Unimproved	2	0	2
Eloped	1	0	1
Died	1	0	1
Total	20	3	23

Sixth Admissions.—The sixth admissions consist of 14 males and two females; total sixteen. Of these, there were

	Males.	Females.	Total.
Cured	12	2	14
Unimproved	2	0	2
Total	14	2	16

Seventh Admissions.—Eight males and 2 females were each admitted a seventh time, and discharged as follows:

	Males.	Females.	Total.
Cured	6	1	7
Unimproved	1	0	1
Died	0	1	1
Remain	1	0	1
Total	8	2	10

Admissions subsequent to the seventh.—No female was received more than seven times. The admissions of a higher number were exclusively of males. A succinct account of them is contained in the following schedule.

5	were	received	8	times	each, and	discharged,	4 cured,	1 improved.
5	"	9	"	"	"	4 "		1 eloped.
5	"	10	"	"	"	4 "		1 improved.
5	"	11	"	"	"	5 "		
3	"	12	"	"	"	3 "		
2	"	13	"	"	"	2 "		
2	"	14	"	"	"	1 "		1 improved.

One man was received 12 times more; and discharged *cured* 7 times, *relieved* five times. His last discharge was about twelve years since, and during the interval between that time and the present, his habits have been strictly temperate, and his mental condition perfectly healthy.

Of all diseases to which the human race is subject, there is none that more completely unmans its unfortunate victim, more entirely divests him of all the attributes, the possession of which has justified him in assuming the title of "the Lord of Creation," than delirium tremens, when in the plenitude of its activity.

The quivering tongue, the disordered stomach, the torpid liver, the rapid pulse, the contracted pupil, the inability to sleep, the irregularity of nervous power, the impotent functions of the brain, and the consequent insubordination of the system to its control—these physical symptoms, though much, are but little, when compared with the mental phenomena resulting from them. The depraved action of the avenues to the mind, the external senses, and the unhealthy functions of the perceptive faculties, whence the patient is unable to appreciate or understand the nature or the relations of the objects by which he is surrounded; the entire confusion of his ideas of matter, time and space, the laws by which they are regulated, and the inevitable results of those laws, if not the least alarming are certainly less

prominent and imposing than some of the other symptoms. These may be called the negative mental phenomena. The positions are more salient, and hence make a stronger impression upon the beholder. They are the visions which are continually conjured up by a wayward, excited and ungovernable imagination, more varied in their forms and characters than are the designs of the artist, more diverse and unstable than the ever-changing pictures of a phantasmagoria. The walls of his apartment, mere mortar and whitewash to the view of other people, present to the patient pictures of every possible variety in character and composition. Animals of various kinds throng into his room, crouch before him, with threatening gestures, and grimaces the most frightful, creep beneath his bed or crawl upon it with torturing menaces. Enemies in human form spring up to bind, to drag to prison, to the tribunal of justice, to the rack, or to the place of execution, or perchance to shoot or to slay with the sword; and, finally, the phantoms of the ideal world, spectres with gorgon heads, and bodies more hideous than those of the satyr or the fabled tenants of the lower regions, glower upon him with their eyes of fire, gnash their teeth in fiendish defiance, at length seize upon him, and he struggles with them in the full faith that he has encountered the devil incarnate.

Such are the features which constitute the most distinctive, and to some the most appalling characteristics of this disease. How beautiful the results of the harmonious movements of that system which, as the crowning work of the creation, was both "fearfully and wonderfully made;" yet how revolting the effects of its discordant action!

But, as has already been observed and demonstrated, notwithstanding the remarkable physical disorder, and the heterogeneous medley of mental phenomena, attendant upon the malady in question, there are but few acute diseases involving any important organ or series of organs, which are more curable. The physical powers, though so nearly prostrate, rise with a resiliency truly remarkable, and the mind rapidly resumes the powers of its healthy action.

There are few, if any, diseases, the rules for the treatment of which are less clearly defined than delirium tremens. Perhaps there is none in which the system of medication is less uniform in the hands of different practitioners.

The treatment formerly pursued at this institution, may be inferred from the following synopsis of the prescriptions for ten patients, admitted at different periods, from 1821 to 1844.

1. Tartar emetic, Epsom salts, and the warm bath.
2. Epsom salts and tartar emetic.
3. Laudanum.
4. Opium and hellebore.
5. Opium, hellebore, and serpentaria.
6. Laudanum, tincture of hellebore, infusion of chamomile and valerian.
7. Calomel, senna, and the infusion of valerian.
8. Camphor, opium and wine.
9. Calomel, opium, camphor, infusion of chamomile and valerian.
10. Calomel, Dover's powder, and castor oil.

It has been already observed that delirium tremens is not usually considered as ranking under the general head of insanity proper. What opinion soever may be entertained upon this subject, the malady is so different from ordinary mental alienation, in both its characteristics and its duration, that the therapeutic principles adapted to the treatment of the

former are entirely inapplicable to the latter. Hence, as well as for reasons hereafter to be mentioned, we have ever held the opinion—and it has been very strongly confirmed by the practical observation of several years—that cases of delirium tremens ought not to be admitted into institutions intended for the insane.

The disease is of short duration, and consequently the patient requires *absolute* seclusion, or close confinement for but a limited period. The converse of this proposition, as a general rule, obtains with the insane. The internal police of an asylum cannot, therefore, be adapted to the necessities of the two classes. The supervision, the restraint, the abridgment of liberty necessary for the one, are not so for the other. If the delirium patients, after recovery from the immediate effects of the disease, be allowed to have all the privileges to which they are entitled, compatible with their condition, ill feeling and jealousy are engendered among the insane, to whom those privileges cannot safely be extended.

It is to be hoped that the State, hitherto so watchful of the interests of the insane, the deaf and dumb, and the blind, within its jurisdiction, and so liberal in its appropriations for their benefit, will, at no distant period, establish an institution for the intemperate.

Of the many cases which have been admitted into this institution, there have been but comparatively few instances of reform from the habit of intoxication. Such reformation could not be expected from the brief term of seclusion to which the patients are subjected. Accustomed, as the persons have been, in most cases, for many years, to the use of liquor, the whole frame, and particularly the nervous system—these organs so mysterious in their organization, so wonderful in their functions, and so difficult of control—have adapted themselves to the stimulus to such a degree, that it has almost become a matter of necessity. Every system of organs, every organ, every fibre, every ultimate corpuscle which assists in making up the fabric of the body, and lends its agency in prosecuting the phenomena of vitality, has, as it were, obtained an abnormal appetite, which calls loudly and perseveringly for indulgence. Hence the only hope of reformation, in a great majority of cases, lies in a prolonged seclusion, and a compulsory abstinence from stimuli a sufficient length of time to permit a thorough regeneration of the whole frame. If the patient be placed beyond the reach of liquor, in an institution conducted upon the best of hygienic principles; furnished with plain but nutritious food, and take sufficient exercise in some useful manual employment to promote the healthy action of every part of the system, the process of renovation would proceed with considerable rapidity. The absorbents, and all the organs of secretion acting vigourously, would constantly be throwing out of the body the unhealthy particles of which it is composed, while the organs of assimilation would as continually supply their places with new healthy and energetic matter, unaccustomed to the deteriorating effects of stimulus, and capable, without it, of performing with vigour its office in the functions of animal life.

ART. VII.—*Pseudarthrosis in both Bones of the Leg, resulting from absorption of Callus, treated unsuccessfully by Excision and Caustic, and again by Resection.* By HENRY H. SMITH, M. D., Lecturer on Surgery, Philadelphia, [with 3 wood-cuts.]

THE interest felt in the treatment of cases of Pseudarthrosis, the numerous plans proposed for the treatment, and the varied estimation in which they are held, induce me to believe that the details of the following case, by showing the dangers resulting from two plans of operating, may not prove uninstructive.

From an inspection of the valuable tables by Dr. Geo. W. Norris, of this city, published in the No. of this Journal for Jan. 1842, it appears "that the Seton enjoys the greatest popularity in the treatment of this affection, and according to the published results (allowance being made for unsuccessful cases not printed), it has also obtained the best results. Thus, out of 150 cases reported, 46 were treated by the seton; of which 36 were cured; 3 partially cured; 5 not benefited, and 2 died."

Proposed by one whose well-earned celebrity placed him at the head of surgery in this country, the seton is so constantly referred to, in connection with false joints, that every tyro in the profession would probably suggest it as the means most likely to effect a cure. It seems, therefore, necessary to premise, that it was not resorted to in the following case, because the great difficulty of exciting the proper inflammatory action, together with the patient's apparent indifference to pain, induced the belief that more active measures would be required—a belief unfortunately too strongly confirmed by the result.

Mrs. ———, æt. 30, of sanguine temperament, moderate embonpoint, and in the apparent enjoyment of excellent health, was thrown from her carriage, Nov. 9th, 1844, at 5 P. M. Soon after the accident, she was removed to an adjoining house where I saw her, suffering from a fracture of the left leg, and an injury on the left side of the body. Being joined shortly after my arrival by Dr. G. Emerson, a temporary dressing was applied, and the patient conveyed on a settee to her residence.

After preparing a fracture bedstead and bed, we re-dressed the limb, and found, upon a more careful examination, a fracture of the tibia near the middle, and one of the fibula at its lower third, accompanied by a considerable contusion of the soft parts. There was also a large effusion of blood, beneath the integuments, which partially escaped through an opening made by a needle-shaped spicula of bone. This opening was so small, that, strictly speaking, the accident was a simple fracture, though with every prospect of becoming compound. The bruises of the body required but little attention.

The patient being placed upon the fracture bed, the limb was placed in a fracture-box, covered with cold cloths to combat the inflammation around the injury, and an anodyne administered to quiet the twitches of the extremity. On further inquiry, we found that Mrs. ——, though now in the enjoyment of good health, had but just recovered from an abortion, which had confined her to the house for several weeks.

By continuance of the cold lead-water dressings, the slight puncture of the integuments healed readily; the contused portion did not slough, and the fracture under the ordinary treatment ultimately united. The union, however, was very slow; so much so, that, during the ninth week, I was

obliged to apply several blisters over the seat of injury, in order to increase the action in the part and the development of provisional callus. During the eleventh week, the limb had become sufficiently firm to allow the patient to be placed on a sofa, the leg being well protected by paste-board splints, and bandages; shortly after which, she was allowed to walk about her room on crutches, but not to use the limb. At this period I was taken sick, and Mrs. —— being extremely sensitive as to any inspection of her leg, would not permit other medical attendance, believing that she was nearly well, and trusting from day to day for my return to business. During this interval of nine days, the bandage about the foot became loose, and catching on something, threw her upon the floor, rupturing the provisional callus, and displacing the fracture. From this time, and until my recovery, she continued under the care of my father-in-law Dr. Horner. Dr. H., on his first visit, finding the bones displaced, the provisional callus destroyed, and the limb swelled, directed perfect rest, and shortly afterwards applied the dextrine apparatus; but without benefit.

March 1, 1845. I again took charge of Mrs. ———, Dr. Horner continuing in consultation. The bones were yet movable; the lower fragment of the tibia projected forwards; the provisional callus, previously distinct, was almost entirely gone, and the leg yielded at the fracture upon the least movement. Friction of the ends of the bones was now practised; extension applied to coaptate the fracture, and the limb dressed so as to preserve the most perfect rest in the part, whilst a full and generous diet, with tonics, was directed. But all to no effect. She now also suffered from menorrhagia and dysmenorrhœa, to which I then first learned she was subject; and in June, seven months after her accident, aborted at about the sixth week of pregnancy. Her general health, therefore, required constant attention.

The ends of the bone were now evidently rounded off, and covered with a new substance; her strength much impaired by confinement; and as there seemed to be no prospect of union without an operation, an apparatus similar in principle to Hutchinson's splint, was applied to the limb, so as to enable her to walk with the assistance of a cane.

By this splint (like that of Hutchinson, except in the material (tin) being moulded to the limb instead of flat), the weight of the body was borne by the strings below the knee; the bones were prevented from being displaced by the extension applied to the ankle; and the splints, projecting a little beyond the foot, were therefore the point of support.

With a view, also, of improving the tone of her general system, and preparing her for an operation in the fall, I accompanied her to the sea shore, where she spent the summer, and rapidly regained her strength; though still annoyed by lumbar pains and menorrhagia.

On her return to the city in the latter part of August, I advised an examination per vaginam, under the idea that a polypus uteri might be the source of her trouble; nothing, however, was found wrong in this organ except a slight prolapsus, which was relieved by the use of a pessary, and cold astringent lotions. The limb now presented the well-marked characters of a false joint. The bones were movable in every direction; the end of the lower fragment which projected, could be felt rounded off, though attached to the upper by an intervening ligamentous tissue: the muscles were much wasted, and the patient unable to stand upon the leg without the splint or other assistance, the limb yielding laterally or forwards, upon her making the least attempt at locomotion. In the latter part of September, as her

general health was good, as she had been free from any uterine derangement for two months, and had gained several pounds in weight, she requested that other means might be resorted to, to relieve her of her accident. Dr. J. Rhea Barton was therefore added to her previous attendants, and it was decided in consultation, that, owing to the lapse of time, the tardy union, and the peculiar circumstances of her case, especially in respect to inflammatory action, a seton would probably fail, and that rasping the ends of the bones, and the application of caustic potash, so as to create a new surface on the broken ends of the tibia, would be preferable.

Accordingly, Oct. 1st, 1845, eleven months after the first accident, in the presence of Drs. Horner, Barton, Emerson, and Sickle of the navy, I cut down in an oblique direction upon the fracture; dissected out the ligamentous matter uniting the bones; removed with a small metacarpal saw the lamina of bone on the lower fragment, and shaved off as much of that on the upper as I could; applied the caustic potash freely to both ends of the bone, and filled the wound with patent lint, so as to render it easy to re-apply the caustic if requisite. The limb was then placed in a fracture-box; poulticed, &c. &c., until free suppuration commenced, when Dr. Barton's excellent bran dressing was applied and continued during the discharge. *Very little inflammation resulted from this operation, and there was but trifling fever at any time after it was performed.* The caustic was therefore reapplied at the end of a week, and the wound then allowed to heal, which it did about the middle of January, 1846. Until Feb. 22d, the usual dressing was continued, with much prospect of a successful result, but on examining the limb subsequently, more freely than had been previously done, we had the mortification to find that there was little or no union.

On March 5th, the patient was therefore allowed to sit up in bed, and gradually to move about, her limb being placed in the iron splints, hereafter described, the operation being regarded as a failure.

During her treatment, she was unwell every three or five weeks, generally for a week at a time, and owing to anxiety to see a brother who was dying of consumption in the upper part of the city, she had made repeated efforts to sit up in bed, and was otherwise restless, although this I did not learn until some time afterwards, having been deceived by the nurse. — A second false joint being thus established, and the summer advancing, I took her again to the sea shore; gave her chalybeates, and endeavoured to overcome the irregularity in her uterine system by every possible plan of treatment. During this period, she took freely of phosphate of iron and lime, more as a forlorn hope than with any decided expectation of benefit to the fracture.

On her return to the city, a consultation was again held. The ends of the tibia were now more distinctly rounded off, and could be felt through the integuments riding upon each other to the extent of an inch: movable in every direction, as before, whilst the whole limb was much attenuated: but her general health was fair. In this state she continued until the early part of November, when, with a heroism worthy of success, she again determined to submit to an operation; anything being preferable, to use her own expression, "to her present useless condition in her family." Accordingly, it was determined in consultation, to practise resection, and to cut off the ends of both fragments of the tibia, so as to convert an oblique into a transverse fracture, in order that if the operation should

again fail, the surfaces of the bones, by presenting evenly to each other, might support her weight, and therefore be more useful in progression. As the bones already overlapped, and as the proposed excision was to be limited to the portion displaced, it was not supposed that the re-section would in any way add to the existing shortening, and this was proved in the termination of the case.

I therefore on Thursday, Nov. 19th, 1846, at 10½ A. M., two years and one week after her original accident, proceeded to operate, assisted by Drs. Barton, J. M. Wallace, and F. C. Smith. The limb being extended, I made an incision about six inches long, through the integuments on the inside of the tibia parallel with the bone, and distant about four lines from the inner edge of the shin. (Fig. 1.)

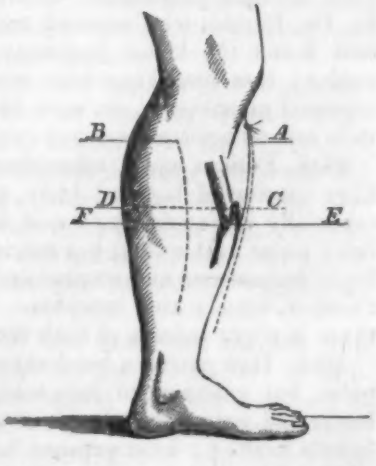
I next made a similar one (B) on the fibular side of the leg (A), and connected the two by a transverse cut (E F) directly over the seat of fracture, so as to form a letter H. The two flaps were then dissected back about 2½ inches each way, so as to expose the bones, when the fascia and muscles were freed from the outside of the tibia, as far as the interosseous ligament.

A similar dissection was now made on the inside of the tibia, keeping as close to the bone as possible, in order to avoid the posterior tibial artery, and the part being thus freely exposed, presented a true pseudarthrosis, with a ligamentous capsule surrounding and extending between the ends of the bones. This capsule being opened, presented the well-marked characters of a false joint.

The bones were completely rounded off, as seen after amputations, covered by a lamina of compact structure, and true articular cartilage; whilst a shining tissue, resembling the synovial membrane, and containing a clear fluid, like synovia, filled up the cavity of the joint.

After dividing the new capsule, and also the interosseous ligament, the bones were allowed to overlap, and a retractor being passed beneath them to protect the soft parts, the upper point of the lower fragment was sawed off transversely, with the common amputating saw, the bone being freely turned out of the flesh. The retractor being next passed under the lower end of the upper fragment, a similar portion (C D) was removed from it by the same instrument, and a slight extension being made, the two transverse surfaces thus formed, were placed in close contact by the line C D. During the operation there was but little blood lost, only one or two vessels requiring ligatures, except on dividing the upper fragment of the bone, where an artery in the cancellated structure, bled freely; but it was subsequently arrested by touching it with the nitrate of silver, pressure with a cold sponge, &c.

Fig. 1.



The limb being now straightened, the flaps were united at the corners by a few stitches; covered with cerate; and laid in a fracture-box with bran; whilst under the use of anodynes, the patient slept comfortably.

9 *P. M.* Mrs. ——— has reacted fully, and slept tranquilly, though occasionally annoyed by starting of the limb.

20*th*, 9½ *A. M.* Has had a good night; slight fever, little annoyance from limb, still disposed to sleep; ordered low diet and perfect rest. 2 *o'clock* Was called suddenly on account of hemorrhage; found that spasm of the limb had deranged the bones, and that the bleeding came from the artery in the bone before referred to. Replacing the fragment sufficed to arrest it.

9 *P. M.* Considerable fever; pulse 120; skin dry; tongue moist and clean; much nervous excitement, violent pain in back, and frequent spasm of limb. Ordered mist. neut. and solut. morph. pro re natâ.

22*d*, 9 *A. M.* Has had a restless night; pulse 140, tongue coated, skin hot and dry, violent pain in back, with extreme uneasiness; no movement of bowels since operation; leg easy. Continued morphia, mist. neut., and gave pills of extract of colocynth comp.

23*d*, 12 *o'clock*. Dressed limb to-day, assisted by Drs. Barton and Wallace; wound healthy, and covered by a free supply of good pus. Bones perfectly in position. A slight movement made in dressing, caused the flow of a little blood, evidently from the bone. Granulations commencing in wound and on bones; bran dressing continued; stitches allowed to remain; ordered increase of diet, as chicken-broth and light food, in hopes of reducing irritability and frequency of pulse, and making up for drain from wound.

24*th*, 9 *A. M.* In good spirits, pulse frequent, but soft; tongue cleaner; skin dry; treatment continued. 12 *o'clock*. Was called in haste, Mrs. ——— having had a severe chill about one hour since, with a return of spasm; great nervous prostration; weeping and hysterical; complains of aching pains in the sole of her foot; pulse 145, and feeble; skin cold and dry; ordered quinine grs. i, every two hours, morphia grs. ss, pro re natâ, and beef tea, with brandy. 4 *o'clock*. Patient has reacted, but still suffering severely from pain in the foot: removed the bran from wound, and found the lower flap sloughing for 1½ inches; sides of wound tumid, pus sanious and offensive; cut out the sutures; dressed wound with a little extra bran, and renewed the morphia and stimulants. 10 *P. M.* Has continued to suffer from violent spasms of leg; pulse very feeble, over 140; great nervous prostration; so much pain in the limbs, &c. &c., that I sent for Dr. Barton, who assisted me in renewing the entire dressing. We now found the lower fragment displaced; re-set it; removed one other suture; free discharge from wound; dressed the limb again with bran; repeated morphia gr. ss, with Hoffman's anodyne; ordered food at intervals, and as her state seemed critical, I passed the night in the house.

25*th*. Patient had a tolerable night; took very freely of anodyne to relieve spasms of leg and body, generally, some of which were so violent, especially whenever she dozed, as to require some one to hold her in the bed; pulse 150, quick, but not so irritable; still much prostrated; pain in limb, deep-seated and continuous; ordered quinine grs. ii, every two hours; chicken, brandy and morphia. Foot presents a red spot on instep, and there is slight œdema of limb threatening erysipelas.

26*th*. Has passed a good night; pulse feeble, but regular; slight erysipelas, but confined to foot, which is very œdematous; pus from wound better and very free: slough of two inches of lower flap separated; granulations healthy; bone exposed where flap sloughed; appearance of tongue good; skin slightly moist. Ordered full diet, porter and quinine; learned that fever, which comes on every evening, lasted last night from 4 P. M. until 1 A. M.

30*th.* Assisted by Drs. Barton and Wallace, changed the dressing; wound looks healthy; pulse good; bones in position; the inner side of upper fragment highly vascular and granulating; profuse sweat in night; limb dressed with Boyer's splints and bandage of Scultetus; ordered citrate of iron, and quinine, with full diet.

Dec. 5*th.* After doing well to this date, with only a slight decline of appetite, there was a return of uterine hemorrhage last night, accompanied by violent twitchings and spasms of whole body. The teeth were closed so tightly during the spasm as to break the first bicuspid. These spasms were relieved by large doses of morphia administered by me constantly during the night. To-day, on opening the dressing, we found the lower fragment overlapping the upper, having been displaced by the spasms. Extension drew it to the proper position, where slight pressure on the front of the bone retained it. Top of foot red and œdematous; circulation in it languid, with slight show of erysipelas: skin there perfectly intolerant of pressure. Consultation ordered, infun. of serpentaria and elixr. vitl., with as nutritious a diet as she can take. 6 *P.M.* Has had another heavy chill with general spasm, and pain in head; leg comfortable, but foot much swelled, puffy and red; applied lead-water to foot, and ordered pills of musk and camphor.

6*th.* On opening dressing, found bone again displaced; pus evident on the instep where the pain has been so severe; dressed leg with paste-board splints around the limb, and continued apparatus of Boyer. Continued treatment.

11*th.* Foot has continued swelled and fluctuating on instep, but as yet shows no pointing of matter; bone perfectly in place; wound at fracture almost healed, and very healthy, notwithstanding state of foot; constitutional symptoms improved; diet moderate; continued splints of Boyer with paste-board, compresses on upper end of lower fragment, and Scultetus' bandage, as before applied.

13*th.* The abscess on instep opened last night, and discharged about a teacupful of pus much mixed with serum; symptoms much improved.

16*th.* Continued to do well since last date, but had a heavy chill at 8 A. M. to-day, which lasted one hour and a half, accompanied by frequent vomiting of bilious matter; wound improving; foot slightly swelled, and discharging a more watery fluid, in very small quantity.

17*th.* Considerable fever; pulse 115; constant nausea and vomiting; tenderness of abdomen probably consequent on vomiting; bowels freely opened by an enema; wound nearly healed at fracture; but the foot is again much swelled, and erysipelas is there developed, the skin being red and vesiculated as far as the ankle; discharge from foot profuse, thin, and watery; red splotches on inside of thigh, *but no erysipelas between ankle and knee*, where the parts are covered by the bandage. Ordered comp. cathartic pills, and as much nourishment as can be given. Laudanum clothes to erysipelatous parts.

18*th*, 9 *A. M.* Nausea and vomiting of bile continued all day yesterday; tongue red and moist, with slight fur; pulse feeble; countenance heavy and listless; no pain in foot; *wound at fracture continues to do well;* erysipelatous redness of thigh somewhat increased; groin painful; limb dressed as before. Ordered ol. terebinth. and ol. menth. ppt., āā gtt. j, on sugar; mustard plaster to epigastrium; and lime-water and milk. 4 *P. M.* Still vomiting; no relief; unable to retain a teaspoonful of cold water one minute; no epigastric pain, although tender on pressure. Or-

dered clothes wet with tinct. camph. to abdomen. 8 *P. M.* Pulse very quick, feeble and irritable; has vomited about one quart of water and bile at a time, which was followed by temporary relief; but efforts to vomit soon returned; has had hiccough from time to time. Ordered iced champagne, of which a wineglassful was retained twenty minutes; then ordered two old opium pills, and no liquid except cold water by teaspoonful.

19*th*, 9½ *A. M.* Has retained opium pill and rested well; no vomiting since 9½ P. M.; pulse quick, but softer; slight perspiration; limb and groin easier. Ordered a little cold arrowroot and barley water.

20*th*, 9½ *A. M.* No vomiting; rested tranquilly, and seems comfortable, but feeble; pulse small, soft and frequent; skin natural; *foot and leg doing well;* bandage of Scultetus continued up thigh, (where erratic erysipelas continues,) in expectation of its acting as on leg. Ordered nutritious diet, porter and quinine every hour. 6 *P. M.* Called in haste, and found patient recovering from sudden fainting, very feeble, and much oppressed in breathing; gave brandy freely, and used external stimulants till reaction; then gave musk and camphor pill, with quinine at intermediate hours. 10½ *P. M.* Had another fainting spell, which lasted near an hour; prostration extreme, accompanied with great dulness of intellect. Remained with her all night, and continued stimulants every hour.

21*st*, 9 *A. M.* A little more strength of pulse; respiration stronger and easier; tongue moist; abdomen soft; erysipelas better on front of thigh, but travelling up on back of buttock; no nausea; has taken freely of thick barley water, with a tablespoonful of brandy, and one grain of quinine every hour during night; expresses herself easy, but extremely feeble. Ordered stimulants to fullest extent. 9 *P. M.* Free reaction; skin warm and in free perspiration; slight and occasional nausea; has taken cream and calf's-foot jelly every hour; one opium suppository, and pills of musk and camphor, with wine whey for drink, our wish being to pour in food, &c., to the utmost extent.

22*d*. Has passed a good night; countenance natural; pulse soft, but frequent, 110 in a minute; skin moist; has perspired all night; slight appetite; limb looking better; *desquamating under bandage on thigh;* beyond the bandage as high as the buttock, there is vesication, but less redness. Ordered quinine gr. j every hour, wine whey, jelly, &c.

23*d*. Rather weaker to-day in consequence of free colliquative perspiration, which continued all night, and till 10 A. M.; limb not dressed on account of prostration. Treatment continued.

24*th*. Prostration this morning extreme; other symptoms extremely bad; apparently sinking. Ordered phosphate of iron gr. ii., thrice daily, and omit quinine, on account of its affecting head; boluses of chicken and bread, highly seasoned, to be given every hour; suppository of opium; pills of musk and camphor. These I continued all through the night whenever she was awake.

25*th*. A marked improvement since 1 *A. M.*, after free movement of bowels; pulse softer and fuller; countenance better, and expresses herself comfortable; on dressing limb, found erysipelas better; wound healed, except a spot of very superficial ulceration of half inch; slight redness and fluctuation again in instep; dressings re-applied. Ordered venison, chicken salad and ale, articles which she strongly desires.

27*th*. Awoke much refreshed, and seems better, though very feeble; tongue more moist; pulse soft.

28*th*. Has rested well; on renewing dressing found wound at fracture

healed; limb free from redness except above thigh, where there is still a little erratic erysipelas, though slight.

30th. Erysipelas has entirely disappeared; she has had no hectic or sweats for three days; appetite good, and advantage taken of it; evidently convalescent; the mild purging of the bowels and diet seems to have acted admirably in producing the crisis of the disease.

Jan. 4th, 1847. Opened limb to-day and found it evidently stiffer at fracture, and otherwise doing well; constitutional symptoms improving; full diet.

24th. Dressed limb, which continues to stiffen; continued paste-board splints all round it; applied a modified club-foot apparatus, as hereafter described, and allowed patient to sit up in bed in order to relieve back, which is suffering from pressure; full diet.

March 27th. Has been sitting up in bed since last date; union is now perfect, though still soft; progresses slowly.

This state of things continuing for four weeks longer, she was then allowed to move with crutches to an easy chair, the fracture being firm, but without as large an amount of provisional callus as was hoped for. The dressing being now changed only once in ten days, and there being no modification of treatment, no note was taken until *May 10th*, when a consultation was again held to judge of the state of the callus, as I trusted to show a successful result of all our labours.

May 10th. Drs. Barton, Horner, Emerson and Wallace, visited patient to-day. She has been walking about her room with splints and crutches for two weeks, without feeling any inconvenience. On opening the dressing, we were, however, mortified to find the callus evidently softer, and motion in a lateral or antero-posterior direction; limb wasted considerably since last seen in consultation, but general health good. As the case seemed likely to take its former course, and there was an evident tendency to re-absorption of the callus, she was ordered, after mature deliberation, to continue to move about, in hopes of exciting the action in the part. The appearances of cure, judging from our previous knowledge of her case, being at present most distant.

June 7th. Mrs. ——— has been walking about with the iron splint and crutches since last note, and complains of soreness at the fracture. The callus has entirely disappeared, and the limb is freely movable in every direction; general health excellent.

Oct. 1st. Having passed the summer in the country, Mrs. ——— has been enabled to walk about readily with only a cane, and when she forgets it, can walk alone, but soon becomes afraid of falling, and has to resort again to its support. The halt in her gait is but slight, the shortening of the limb being compensated by a piece of cork placed inside the heel of her shoe. At present the limb is dressed with a laced stocking, to support the venous circulation and prevent swelling, she having now used a bandage for three years. When the laced stocking is on, she can raise or move her leg in any direction, as the bones are so closely approximated by the muscles, and also held together by ligamentous structure, that the support of the stocking is sufficient. An enlargement of the upper end of the lower fragment, caused by a small amount of new callus, materially increases the firmness at the fracture. When the iron splint is on, she suffers but little inconvenience, although she cannot yet give up the cane, which habit has rendered apparently necessary.

This splint (before referred to) has answered so well, that I am tempted

to describe it, not from its novelty, but simply from its perfect adaptation to such cases—an adaptation which, it is thought, may be advantageously repeated in similar injuries, not only in the leg, but also, when modified, in ununited fractures of the arm or forearm. It consists, as at present worn by Mrs. ——, of two narrow pieces of steel, A A, of the length of the limb, connected at the bottom, close under the sole of the shoe, by a cross-piece, C, of the same material. At the top, and also in the middle, and near the ankle, there is a connecting piece, well padded, to support the limb behind, B–D–E. A similar connecting piece, B, moving on a hinge, and fastening by straps, is attached to the top in front, while a padded splint, H, with a strap, supports the seat of fracture, and prevents any lateral or anterior deviation. The strap at F, tends to keep the apparatus in its place, and the shoe being made with stiff sides, supports the ankle. The foot being introduced into the shoe, and the straps all fastened, it will be found that the connecting bands at the top, by surrounding the limb, mainly support the weight of the body, the pressure being borne chiefly by the front of the head of the tibia, whilst the transverse ends of the bone being approximated so as to assist in the support, are prevented from deviating from their proper line, by the pad and piece in the middle.

Fig. 2.

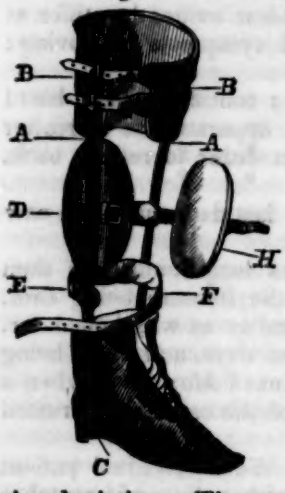


Fig. 3.

After the first operation, when the fracture was an oblique one, it was necessary to surround the leg with the jointed sheet iron pieces represented in fig. 3. In addition to which, the side splints, A, fig. 2, were longer, and consequently came one inch below the sole of the shoe. The patient, therefore, walked on the end of the splint, the foot not touching the ground, and the main weight of the body was borne by the knee in the same way as in the use of a cork leg after amputation. The movements even at this time were, however, more natural than is the case in most cork legs.

Now, supposing the case was a pseudarthrosis of the humerus or bones of the forearm, is it not probable that sufficient stiffness would be given to the part by an apparatus somewhat similar to fig. 3? Would not a patient be much better with the limb thus surrounded, than would be the case after amputation?

The femur would be an exception, but in the other bones of the extremities, a splint like fig. 2, would certainly give a more comely and useful limb than any false one that could be applied to a stump. Here, as in so many other instances, may amputation be regarded as indicating the deficiencies of surgery.

In reviewing the history of this case, we think that there can be no difficulty in tracing the cause of a defective callus, to uterine disturbance. Whatever may have been the peculiarities of treatment, even as viewed

by those who may advocate other measures, nothing interfered with the first callus. Surrounded by every luxury, there was no article likely to prove useful, that was not to be had at a moment's notice. The patient's health, judging by her appearance, was most robust; her age highly favourable; the limb dressed with great care, and yet a deficiency of callus showed itself in a marked degree.

In the condition of the patient immediately after the first operation (excision and caustic), we also see a state of things that could not have been anticipated, but little reaction following measures that generally produce so much general irritation. Again, after the second operation (resection), we find a most severe train of symptoms, threatening life, and leaving her for days on the verge of the grave. The inflammatory action was here ample, but not too much; for though erysipelas attacked the limb several different times, it did not invade the portion around the fracture. Yet here the callus was very slowly formed, and when deposited for the third time, contrary to all reasonable expectation, disappeared. During the treatment, the effect of phosphate of lime was in no degree perceptible. Indeed, little benefit was anticipated, though the experiment seemed worth a trial.

The peculiarity of the erysipelatous attacks, not invading the leg, may, we think, be explained by the action of the bandage which surrounded it. As nothing has proved of much utility in this annoying complaint, we should feel strongly tempted hereafter to test the efficacy of this simple but powerful agent. Whether it was of use by supporting the capillary vessels and diminishing the circulation in the skin, or whether it acted like the bran dressing, which we have also seen check it, (by excluding the atmosphere and promoting perspiration,) must be as yet matter of theory. The result will probably be the same in either case.*

Judging, then, from our own experience in the operations performed in this instance, we most fully agree in the opinion so generally expressed, that these operations, as a class, especially resection, are among the gravest in surgery. In a similar case we should prefer trying the seton, or friction produced by causing the patient to use the limb, protected by some such apparatus as that above described, before resorting to any operation; and in few if any cases of false joint, as a general rule, would we be tempted to amputate.

* Since the above was written, we have seen a paper by Assistant Surgeon E. J. Bee, U. S. Navy, in which a similar result, from the use of the bandage, has been obtained in the treatment of traumatic erysipelas. (See this Journal for October, 1847.) Our attention was first called to this action of the roller in 1839, in a case in which Velpeau applied the dextrine bandage for fracture, and though the lad had small-pox badly, few if any pustules showed themselves under the dressing, it acting as the gold leaf usually directed to save the face. In two bad cases of erysipelas, from injury, we have seen similar results; but to do good the pressure of the bandage must be moderate.

Art. VIII.—*Compound Dislocation of the Ankle-Joint.*

By Emery Bissell, M. D.

Miss J. K., aged twenty years, was thrown with great violence from a carriage, which was run away with by a frightened horse, on the afternoon of August 14th, 1844. The left tibia was dislocated inwards, and projected nearly four inches through a transverse wound of the integuments. These were much bruised, and the lower edge of the wound (about two and a half inches in length) very much "nipped," or doubled inwards. The upper edge embraced the bone with great firmness. By some persons present, and amongst the number one or two medical gentlemen, immediate amputation was urged as the only probable means of saving the life of the young lady. This she opposed most earnestly, and besought me, with much feeling, to attempt to save her limb if I thought there was even the most remote chance of success. The effort to do this, I had mentally resolved to make, and, of course, cheerfully acted in accordance with her wishes. Considerable difficulty attended the reduction from the closeness with which the bone was embraced by the integuments above, and the doubling of the lower edge of the wound, before mentioned. The first obstacle was overcome by freely dividing the integuments an inch and a half upwards, at right angles with the transverse wound. The second was removed by insinuating the fore and middle fingers of the left hand over the doubling of the lower edge of the wound, and drawing it steadily outwards, whilst the same fingers of the right hand were hooked over the lower extremity of the tibia, and the bone strongly pressed upwards. This operation, with moderate extension of the foot, succeeded perfectly in bringing the bone into its proper place. The wound was brought together by adhesive straps, aided by a stitch or two at the angles, was covered lightly with lint and compress, and the whole limb to the knee supported by a Scultet's bandage smoothly and lightly applied. The limb was then carefully laid on a pillow of oat chaff, in a fracture-box, the sides being supported by long bolsters of the same material as the pillow, from the knee to the foot. A full dose of opium was then given, the limb directed to be kept wet with cool water, merely dashed with proof spirits, in order to satisfy popular prejudice, and the patient left for the night.

15*th*. Patient has passed the night comfortably, and is in good spirits this morning. A good deal of bloody and serous discharge from the wound. Limb somewhat swollen, but not highly inflamed. Integuments bruised, and of a deep livid colour. Gave a dose of sulphate of magnesia, followed by a weak solution of tartar emetic every two or three hours. Dressings continued;—wet lint and compress, with a diluted solution of chloride of soda. From this time to the ninth day, the case went on favourably; a free and healthy suppuration occurred about the fifth. The integuments, however, still kept their livid appearance. Treatment mildly antiphlogistic, with a free use of opiates—dressings the same. On the morning of the tenth day, on removing the dressings, the whole of the integuments, below the original wound, came away with them in a sphacelated state, leaving the internal malleolus bare, and a deep cavity below and behind it. Same treatment continued. On the twelfth day from the injury there was a discharge of healthy pus—granulations were beginning to appear—symptom-

atic fever had subsided—patient had a good appetite—rested and slept well at night, with the aid of one grain opium every five hours.

Aug. 28*th.* Fifteenth day. Patient cheerful; has good nights; relishes food well, which she is allowed to select according to inclination. Wound looks well, and is filling up with good granulations. Continue treatment.

Sept. 5*th.* Patient in fine spirits and full of hope. Case in every respect looks favourably. It is evident, however, that an exfoliation of the malleolus will take place. As the surface of the tibia is inclined to slip a little (laterally) upon the astragalus, a light splint was applied upon the outside of the limb from the knee to the foot. A similar one was applied to the inside some days since. Eversion of the foot is prevented by confining it to a movable foot-board, fitted to the fracture-box, just filling it from side to side, and kept in place by a narrow piece across the top.

21*st.* Patient rather indisposed for a few days, in consequence of non-appearance of catamenia. Appetite diminished. Directed Huxham's tincture of bark, with a moderate use of Madeira wine.

Oct. 9*th.* Everything looks well. As the straight position of the limb has become rather irksome, the fracture-box was exchanged for the double inclined plane, the limb resting on the chaff pillow as before, and supported laterally in the same way. Foot also secured by a contrivance similar to the other. Wound fast filling up and contracting its boundaries. Malleolus black and dry.

21*st.* Sore is healed except the space occupied by the dead bone. The whole may be covered by a crown-piece. Patient improves in strength, and amuses herself by reading, sewing, knitting, &c. Removed the limb from the double inclined plane, and placed it in a hollow splint, which allows the patient to be placed in a chair, and to enjoy a change of position in various ways. Dead portion of bone is becoming loose. From this time to the middle of December, there was a steadily progressive improvement in every particular. As the dead bone had become quite loose, it was removed by slight effort. But I found, to my surprise, that it consisted of the whole articulating surface of the tibia—the whole of the epiphysis. On its outer surface, the fragment is about an inch in length, presenting perfectly the groove in which the fibula is lodged. In the middle it looks as if it had been scooped out, and occupied by a conical extremity of the shaft of the bone, so that in the centre it is not much more than a line in thickness.

Jan. 8*th*, 1845. Sore is nearly healed, but with a deep depression in place of the malleolar process. Splint left off. The joint supported by a short hollow splint, extending six or eight inches above it, formed of very compactly hammered sole leather, and fitted very neatly to the limb, and embracing the inner half of the foot. Have used for some time a light flannel bandage.

Feb. 18*th.* Limb is sound. The depression left by the removed bone is considerably less, and the whole foot is regaining its original contour. Patient feels remarkably well, and begins to use crutches. Contrary to my fears of a complete anchylosis, I find the joint allows of considerable motion.

July 1*st.* Miss K. now walks with a little aid from a single crutch. Can bear the whole weight of the body upon the lame foot for a short time. So little is the deformity, that when the foot is dressed with shoe and stocking, a stranger would not notice it. There will be only a slight perma-

nent depression in place of the malleolus, and the motion of the joint is growing more and more free.

Sept. 1846. A trifle more than two years from the time of the accident. Miss K. walks well without crutch or staff; performs all kinds of domestic employment with facility, and ascends and descends a long flight of stairs without difficulty. Motion of the joint quite free. My own gratification in an event so favourable is only equalled by her gratitude for the preservation of the limb.

Nov. 5th, 1847. I met the young lady this day on the side walk in our borough, three miles from her home. She walks, apparently, as well as any one; says her limb is continually becoming stronger, and that the joint is nearly or quite as flexible, and admits of as much freedom of motion, as that of the uninjured limb.

Remarks.—This case adds another to the list of those which mark the triumphs of modern surgery. I was probably more sanguine in my hope of saving the limb, and possibly more persevering in my efforts, from the fact that I had just been reading the reports of Sir Astley Cooper upon the same subject. I am, however, disposed to think I should have saved myself much trouble, and considerably shortened the period necessary to a complete cure, had I resected the extremity of the tibia the length of half an inch or so previous to the reduction. Whether the removal of the extremity of the tibia would not be advisable in all cases, where reduction cannot be effected with facility, is an important question which the wise and experienced of the profession should decide. The cases reported by Sir Astley Cooper, in which it was done, seem to have terminated most favourably.

Norwalk, *Conn.*, *Nov.* 8, 1847.

Art. IX.—*Successful Treatment of a case of Traumatic Tetanus, in which the Vapour of Sulphuric Ether was employed.* By E. W. Theobald, M. D., of Baltimore, Md.

On the 17th Sep., 1847, I was requested to visit Jacob Fifer, aged 27, a native of Germany, and by occupation a quarry-man. Some hours previous to my visiting him, he had received a severe injury of the left hand, by the accidental explosion of a blast. The little finger and its metacarpal bone, together with the soft parts covering it, had been blown off; the first phalanges of the ring and middle fingers broken; the metacarpal bone of the ring-finger, broken and exposed; and the soft parts in the palm of the hand torn across from the ulnar side to the metacarpo-phalangeal articulation of the thumb.

The wound had been dressed immediately after the accident, by my friend Dr. Vanbibben, who transferred the case to me. As there had been considerable loss of blood, I removed such dressings only as interfered with the proper application of my remedies.

The first question, which naturally enough presented itself to my mind, was, should an attempt be made to save the remaining portion of the man's hand? The dorsum of the hand had received no injury; the thumb and index finger were perfect; the circulation throughout the extremity was

good; the patient possessed a fine constitution, and was greatly averse to the removal of the hand. Under these circumstances I felt justified in making an effort to save the member.

Accordingly, I ordered the cold water dressings to be unremittingly applied; protochloride hydrarg. grs. x, and tinct. opii gtts. l, were administered, with instructions to repeat the anodyne in five or six hours if the pain continued severe. In the course of a few hours, however, the pain for the most part subsided, and the anodynes were omitted except at night.

The calomel produced the desired effect; and the symptomatic fever did not run high.

On the 19th, suppuration was established, the water dressings were set aside, and the hand placed in a warm poultice of bread and milk.

On the 22d, the sloughing process commenced, and the fermenting cataplasm was substituted for the bread and milk poultice. Although my patient's suffering had not been great since a few hours after the occurrence of his misfortune, yet, in consequence of his inability to sleep at night, and a desire on my part to ward off tetanus, which I had reason to fear might supervene, I had allowed the quantity of laudanum to be gradually increased, and at this time he was taking 200 drops in the course of the night. Under this plan of treatment my patient appeared to be steadily improving; the wound was granulating, and suppurating freely and healthily, and the cut beginning to cicatrize.

Upon inquiry, on the morning of the 30th, I learned of my patient that he had been suddenly awakened out of sleep the night previous, by a slight twitch of the muscles in the palm of the wounded hand. Alarmed at any symptom which might be considered a forerunner of tetanus, I investigated his case with more than ordinary care for further evidences of the approach of that fearful malady, but could elicit none. I visited him in the afternoon of the same day, and was pleased to learn there had been no return of the spasm.

On the 1st October, however, the attendants informed me he had had several very slight spasms in his hand whilst asleep. At this period he appeared to be doing remarkably well in every respect, and, but for those slight muscular twitchings, I should not have felt the least uneasiness about his case.

Unwilling at this time, to sacrifice his hand, without a more positive assurance of the approach of danger, I determined to place my patient under a course of treatment similar to that which might be adopted, were I convinced tetanus existed. I therefore directed a pill composed of calomel, grs. iij, and pulv. opii gr. i, to be given every two or three hours; acetum opii gtt. xx, three times daily, and sinapisms to the abdomen and along the spine.

The case progressed without further advance of the tetanic symptoms, until the night of the 4th. I was called to him early on the morning of the 5th; the spasms in the hand had increased, and extended to the muscles of the arm. He complained of an uncomfortable feeling about his neck, and of difficulty in swallowing. His skin was bedewed with a warm perspiration, and his pulse 100. On examining the wound, I found the granulations flat and dry. I determined to take the hand off immediately, but before doing so, requested the family to call in Prof. N. R. Smith, that I might have his counsel in the case. In a short time I had the satisfaction to meet Dr. Smith, who agreed with me in opinion, that the symptoms were decidedly tetanic, and that the operation was expedient. I proceeded

at once to amputate the hand, assisted by three of my pupils. After the stump was dressed, there were two or three spasmodic contractions in the arm, at distant intervals, which, however, ceased entirely by night. Just before the operation, I gave the patient forty drops of acet. opii, with instructions to repeat the dose at bed-time, and to continue the pills of calomel and opium.

6 *P. M.* Patient calm and comfortable; when he falls asleep, he is annoyed by slight spasms of the muscles of the neck, and says there is some degree of stiffness in that region. No pain at the præcordia, but hardness of the abdominal muscles to a limited extent. Sinapisms were ordered to be applied to the abdomen and spine, and as his bowels were confined, an enema was directed to be given.

6th, 9 *A. M.* Had a comfortable night; bowels moved, and stump easy; increased amount of spasm and stiffness about the neck, with some degree of trismus. Skin wet with perspiration; pulse 120. ℞.—Anodynes and calomel. 6 *P. M.* More spasm; slight opisthotonos, with increased hardness of the abdomen; deglutition very difficult; jaws nearly closed; pulse 120; great despondency and restlessness, and free perspiration. ℞.—Anodynes increased; calomel continued; mustard applications renewed, and nourishing broths as diet.

7th, 9 *A. M.* Rested badly last night; symptoms all aggravated. Dressed the stump; it looks pretty well, one-fourth united; pulse 120. On this occasion I provided myself with sulph. ether and an inhaler, as I felt disposed to make trial of this new and powerful remedy. I proceeded to administer it without explaining to my patient the nature of the agent, or the objects I had in view. At first there was some difficulty attending its exhibition, in consequence of the irritation it inflicted on the glottis. This, however, soon subsided; he then began to complain that "it made him feel bad," and very shortly pushed the tube from his mouth, and said everything looked black, and refused to breathe it any longer. I persuaded him, however, to breathe it again for a short time, when he fell asleep; the time occupied from the commencement of inhalation until insensibility was produced, being about two minutes. His pulse was accelerated ten beats; breathing perfectly easy; whole muscular system relaxed; and no lividity or unnatural expression of the countenance. I permitted him to sleep fifteen minutes, when I aroused him by wiping his face and forehead with cold water. When consciousness returned, he stated he had been dreaming; drowsiness remained for an hour after. ℞.—Anodynes and calomel. 6 *P. M.* I find my patient evidently better; has had very little spasm through the day, and only when asleep. ℞.—Anodynes and calomel.

8th, 9 *A. M.* Rested well last night; is rather stupid, and disposed to sleep, and is troubled with frequent yawning, which is exceedingly painful, as he cannot open his mouth. For fear of narcotizing him, I directed the anodynes to be discontinued, and ordered strong coffee and nourishing broths to be given him. Omitted the ether also, on account of the apparent cerebral oppression. 6 *P. M.* The spasms have materially increased; there is more stiffness about the neck and jaws; some contraction of the corrugator supercilii and levator labii superioris alæque nasi muscles, giving to the countenance a very distressed and painful expression; deglutition more difficult; pulse 100; not so drowsy. ℞.—Acet. opii gtt. xl at bed-time, and repeat it in the course of the night if he should not rest well; and apply mustard poultice to the abdomen.

9th, 9 *A. M.* Has had a bad night; suffered very much with the spasms

in his back and extremities; abdominal muscles as hard as a board; jaws firmly locked; scarcely able to swallow anything; and great despondency. Administered the sulphuric ether; a few inspirations rendered him insensible; pulse unaffected; expression of the countenance greatly improved; no lividity or paleness of the lips and face; breathing easy; and muscles relaxed. He slept in this condition for fifteen minutes; drowsiness remained for half an hour after. ℞.—Hydrocyanic acid gtt. xxiv; aqua distill. ℥i. A teaspoonful to be taken every five or six hours; a blister to the nape of the neck; sinapisms to the abdomen; and as I discovered slight fetor of the breath, I discontinued the calomel and opium pills. 5 *P. M.* Symptoms all improved; pulse 90; countenance bright and cheerful; has had a comfortable day, and regrets he cannot eat more, as his appetite is good. Four or five inspirations of the ether vapour were sufficient to put him asleep; no unnatural expression of the face, or discoloration of the lips; breathing perfectly easy and natural; pulse unaffected. He slept for half an hour under its influence without spasm; just as its effects were passing off, however, he had two very slight ones. ℞.—As before, and the blister dressed with a bread and milk poultice.

10*th*, 9 *A. M.* Patient rested very well through the night; had a few trifling spasms, and those only when asleep. There is less rigidity of the muscles of the neck and jaws; he complains of some pain in the stump, accompanied by starting of the muscles of the arm. Upon examination, found a superficial slough about the size of a shilling on the lips of that portion of the stump which had not united. Applied fermenting cataplasm to the stump; directed the acid to be continued; and chicken soup diet. No unusual circumstance resulted under the employment of the ether this morning. 5 *P. M.* Patient about the same as at last visit; his bowels had been moved twice in the day. Sulphuric ether administered with similar effects. ℞.—Acid, and acet. opii gtt. xxx, if the bowels were too frequently acted upon.

11*th*, 9 *A. M.* He does not feel so well this morning; thinks he slept too much; bowels had been moved twice in quick succession, and he took the anodyne as instructed. Pulse 92; expression of countenance improved; rigidity of neck and jaws about the same. On account of the drowsy condition in which I found my patient, I omitted the ether, and diminished the dose of the acid to one-half. 5 *P. M.* Pulse 84; slept a good deal through the day; more pain in the stump, and increased spasm; bowels moved once. Ether given. ℞.—Acid.

12*th*, 9½ *A. M.* After visit, and his breathing the ether last evening, he appeared decidedly better, and was more than usually cheerful until 9 *P. M.*, at which time he had a chill, succeeded by cold perspiration; he remained in this condition for an hour, when he became warm, the perspiration continuing. So soon as warmth returned, he became stiff all over (to use his own expression). From this time he rested tolerably well, and had very little spasm or pain in the stump. Pulse 90, soft and full; tongue clean; appetite and spirits good; bowels moved in the night.

He expressed himself as much pleased with the effects of the ether the evening before; thought it was benefiting him very much, and says he has had no bad spasms since. He took the ether this morning cheerfully, indeed asked for it, and breathed it well. Pulse, lips and face unaffected by it, except so far as it relaxed the muscles of the angles of the mouth and eyebrows, removing that peculiar frown and distressed expression which have existed throughout. For fifteen minutes he did not move

a muscle; he then yawned, and remained in a gentle quiet sleep for fifteen minutes longer, when he had three slight spasms; so slight, indeed, that although I was standing over the patient, carefully watching for any phenomena which might occur, I should scarcely have observed them, had not his wife remarked, "that is the kind of spasm he has now." About this time there were several gentle starts in the muscles of the stump also, which appeared to be unconnected with the former. In five minutes more he awoke, feeling, as he said, very comfortable. ℞.—Acid. 5½ *P. M.* Passed a pleasant day; no change in condition since morning visit. ℞.—Acid. Among other objections urged against the employment of sulph. ether vapour in surgical practice, that of its inducing a gangrenous condition of stumps, mentioned in a letter from Dr. James H. Pickford, and published in the Oct. Number of the *Amer. Journ. of Med. Sci.*, occurred to me; and fearing the ether might have some agency in the production of the slough on the stump of my patient, I left it off. ℞.—Acid, and if much pain or restlessness come on in the night, to give acet. opii gtts. xxx.

13*th*, 9 *A. M.* About midnight patient took 30 drops of acet. opii, and slept pretty well until morning. In the course of the night, however, he had three slight chills, two trifling hemorrhages from his nose; his bowels were moved, and there was a material augmentation in the number and violence of the spasms. This morning he complains of more stiffness of his jaws and neck than he has had for several days past; pulse 95; tongue clean; distressed countenance; and he is very drowsy. ℞.—Acid, and the opiate should circumstances require it. 5 *P. M.* Pulse 118; jaws closely and firmly locked; deglutition almost impracticable; bowels have not been moved; has taken no nourishment since last visit; spasms very severe and frequent; considerable degree of opisthotonos. ℞.—A dose of oleum ricini; hydrocyanic acid gtts. ij every four hours, and acet. opii gtts. xxv at bed-time.

14*th*, 9 *A. M.* Slept a portion of the night only; spasms still more frequent, violent, and exceedingly painful; bowels moved by the oil; pulse 120; some pain in the stump; slough has not extended beyond its original limits. In consequence of the aggravated condition of all the tetanic symptoms, and the conviction on my mind that my patient must die if something more was not done for him than I was then doing; and as the ether had appeared to mitigate the violence of the symptoms whilst I employed it, I determined to have recourse to it again, regardless of any pernicious effect it might exert upon the stump. Accordingly I administered it. The immediate effects did not deviate in the slightest degree from those I had observed invariably to attend its exhibition in the case. ℞.—Hydrocyan. acid gtt. ij every four hours. 5 *P. M.* Has had a comfortable day; several light spasms, but not severe enough to awaken him when asleep. Jaws not so closely locked; could pass my little finger between his teeth with ease; pulse 82, and natural; stump improving. ℞.—Acid, as before.

15*th*, 9½ *A. M.* Slept much better than the night before; had several pretty strong spasms; has had good deal of pain in the stump; easier this morning; there is less trismus; deglutition improved; bowels moved this morning, and he is quite cheerful; pulse 95. Healthy granulations have taken the place of the slough on the stump. Breathed the ether vapour; whilst under its operation, his pulse fell to 86. ℞.—Acid. 5 *P. M.* Slept half an hour this morning after inhaling the ether, and has appeared better ever since; but little spasm, and that confined to the stump and arm; com-

plains of severe pains in the stump; appetite good, and he has taken freely of nourishing broths. Pulse 80. ℞.—Acid.

16*th*, 9½ *A. M.* Comfortable night; pain in the stump rendered him a little restless for a time, but this morning it is comparatively easy; has had but few spasms. He still complains occasionally of that universal stiffness which came upon him on the night of the 11th; says whenever he attempts to move himself, his muscles all become stiff; bowels have been moved; tongue clean; appetite very fair, and pulse 90. Inhaled the ether. ℞.—The acid. 5½ *P. M.* Easy all day; spasms fewer and lighter; pulse 82; expression of countenance almost natural; less trismus and difficulty of swallowing.

17*th*, 10 *A. M.* Rather restless last night; some increase in the number of spasms, but none in their force; they are somewhat altered in character; they do not come on suddenly and extend rapidly as heretofore, but begin very slowly and extend gradually from the stump to all the voluntary muscles. He indulged in a supper of meat pudding last night. Not much pain in the stump; much less trismus; pulse 100. Administered ether, slept for half an hour. ℞.—The acid. 5 *P. M.* Spasms confined to stump all day; appetite good; tongue clean; slight pain in the stump; pulse 85.

18*th*, 9½ *A. M.* The pain in the stump did not permit him to sleep well last night; had a few weak spasms whilst asleep, but not severe enough to awaken him; less trismus; bowels moved; pulse 85. Took ether. 5 *P. M.* Pulse 88; bowels moved; stump painful; spasms very weak. Discontinued the hydrocyanic acid.

19*th*, 10 *A. M.* Did not rest well in consequence of pain in the stump; good many weak spasms; trismus, stiffness of neck and difficult deglutition almost entirely disappeared; bowels moved; pulse 90; skin cool and pleasant; tongue clean, and patient in fine spirits. By accident, omitted taking the ether out with me. ℞.—Hydrocyanic acid gtt. ij every four hours. 5 *P. M.* Has had less pain to-day; but few spasms; bowels moved; pulse 90. Deferred giving the ether. R.—Acid.

20*th*, 9½ *A. M.* Had a dreadful night; severe pain through the stump and arm; great increase of spasms; pulse 88. Inhaled the letheon. 5 *P. M.* Is better in every respect.

21*st*, 9½ *A. M.* Rested far better than the night before; had less pain and fewer spasms. Ether vapour administered.

22*d*, 9½ *A. M.* Rested very easy all day yesterday and last night; had a few very slight spasms; complains he cannot get enough to eat; bowels moved; pulse 90. Sat up in a chair for half an hour yesterday evening. From this time, I left off all remedies; the tetanic symptoms which had grown almost imperceptible, disappeared altogether by the 29th. I continued my visits until the morning of the 4th of November, when I found him as follows.:—No spasms or pain since 29th ult.; bowels regular; sleeps well all night; appetite excellent; pulse natural; gaining his strength very fast, and has been visiting his friends in the neighbourhood.

As Prof. Smith felt considerable interest in the case, he honoured me with his presence and counsel on several occasions in the progress of the treatment.

Baltimore, *Nov.* 30*th*, 1847.

ART. X.—*Fracture of the Thigh successfully Treated.* By EZRA MICHENER, M. D., of Chester county, Pennsylvania. [With a wood cut.]

IN the exercise of his profession, the physician will often meet with anomalous cases which require anomalous treatment, and which sometimes impose a severe tax upon his ingenuity and skill. The following case will illustrate my meaning; and while it will claim but a small portion of the reader's time, may afford a practical suggestion to some junior member of the profession.

W. L., a young man in very delicate health, and possessing a highly impressible constitution, sustained a fracture of the upper third of the left femur, and was otherwise considerably injured by the upsetting of a cart on the 26th of the 3d month, 1846.

The bad state of his health, and the condition of the injured limb, unfortunately led his medical adviser to believe that he could not bear the strict confinement usual in such cases; and, consequently, light and insufficient dressings were applied. The constant motion of the fragments which the insecurity of the dressings allowed to take place, and the consequent laceration and irritation of the soft parts, from the progressive overlapping of the bones, produced a high degree of irritative fever. This was erroneously attributed to confinement, and became an inducement to relax the dressings still more. The fragments had now overlapped more than *two inches*. After the lapse of several weeks, the irritation nearly subsided, and union was supposed to have taken place. The dressings were removed, and the patient allowed to rise from his bed. In a very few days the slight exertion which he made, produced a rapid increase of pain, soreness, and swelling in the limb; the thigh became crooked, and the foot was drawn more and more upwards.

I saw the patient on the 4th of the 6th month, just *ten weeks* after the occurrence of the accident. He lay upon his back; the thigh was considerably swelled, and very painful to the slightest touch or motion. The pelvic muscles, acting upon the trochanter, had drawn the upper fragment upwards to near a right angle with the pelvis, while the fragments necessarily formed a similar angle with each other. The foot was drawn up full *seven inches* above its fellow; but the tape measure, following the angulation of the bone, gave a shortening of only *two inches*, as already mentioned, from the overlapping of the bones. The fractured bone appeared to be surrounded by an enormous spongiform callus of four or five inches diameter. Such a callus may reasonably be expected to form where the fragments are allowed continually to change their position, and to disturb the restorative operations which are in progress around them.

To me this case was a perplexing one. The bad health of the patient, his already long confinement, the heat of midsummer, and, still more, the unfortunate state of the limb, presented serious obstacles to a cure. After a little reflection, I proposed and applied the following dressings: (See the accompanying diagram.)

1. The counter-extending band *a* was passed round the groin of the right or sound side, and securely fastened to the head rail of the bedstead. It was placed on the *right side*, in order to allow the *left side* of the pelvis

to rotate downwards, and thus, in some degree, to relieve the tension of the displacing muscles.

2. The extending band *b* was then put round the ankle, and carried over a pulley in the foot-board, and kept tense by a weight.

3. A broad muslin band *c* was then passed round the *right hip*, one end of which was carried beneath the pelvis, the other across the pubis, and secured to the bed-rail on the *left side.*

4. A similar band *d* was next carried round the outside of the fractured limb, the ends of which were passed under the *right* thigh, and over a pulley in the *right* bed-rail. This band was also kept tense by a variable weight.

A mere glance at the rude diagram, will show the general design of these dressings. The first and third bands were mere retainers to prevent the others from displacing the patient. The second was designed to make gradual and constant extension; the intensity of the force to be regulated by circumstances. The fourth was mainly designed to co-operate with, and aid the second in straightening the limb, by directly antagonizing the displacing muscles, with a constant and graduated force; but it was also a prominent intention of this band to *compress* the too redundant callus, and promote its absorption. I was happy to find these intentions completely fulfilled. The patient passed a comparatively comfortable night, and on the following day, it was found that the limb had been gradually and insensibly brought to its proper position—abating the original two inches in its length. The prospect of two or three months additional confinement had very much depressed his spirits; but when he found what a remarkable change had been produced in a few hours without suffering, or even his being conscious of it, he zealously entered into the measure. These were the only dressings made use of during the cure. The exuberant callus was rapidly reduced to a proper size and firmness; the pain and irritation soon subsided, and in a few days the bone began to show signs of consolidation. At the end of *eight weeks*, from my first visit, he was allowed to rise from his bed. Under the circumstances which have been related, it was believed inexpedient to attempt a dislodgment of the overlapped bones—he, therefore, got up with a shortened limb; but he now walks with only a slight limp.

MONOGRAPH.

ART. XI.—*A Statistical Inquiry into the Causes, Symptoms, Pathology, and Treatment of Rupture of the Uterus.* By JAMES D. TRASK, A.M., M.D., Brooklyn, New York. Read before the Brooklyn Medical Association, Oct. 14th, 1847.

THE principal object in undertaking the examination of this subject after the plan adopted in the following paper, was that of determining, if possible, the most successful course of treatment of rupture of the womb, when accompanied by certain conditions which embarrass delivery, and for our conduct under which we have now no definite guide.

At the present day, we imagine that there are few, if any, who would advocate the course formerly pursued, of abandoning all cases of rupture to nature. For many years the profession in England and in this country, influenced by the high authority of Dr. William Hunter, and afterwards by that of Dr. Denman, carefully abstained from any attempt at delivery, as calculated only to increase the patient's suffering, and to diminish her chance of recovery.

This opinion and practice prevailed, notwithstanding several successful cases of delivery in France and Germany, until the year 1784, when Dr. Douglas resorted to artificial delivery, and his patient recovered. Since his time, the universal judgment of the profession appears to be, that delivery, when practicable, should in all cases be resorted to. When a favourable condition of the soft parts, and a proper correspondence between the head and the pelvis will allow of the introduction of the hand, and delivery by version, all authorities agree in recommending it. But when obstacles to a speedy and easy delivery exist, as from contraction of the edge of the rent, after the escape of the fœtus into the peritoneal cavity, or from an undilated os uteri, or from a contraction of the pelvis, or partial closure of the vagina, the rule of practice is by no means determined, and great diversity of opinions exists as to the proper course to be pursued. In each of these cases, we are advised by different authorities to opposite lines of conduct.

Of rupture occurring during pregnancy, *Burns*, p. 266, after discountenancing forced dilatation of the os, and preferring to it the Cæsarean section, adds, "but this ought not to be performed, unless we can thereby save the child, or the patient has reached an advanced period of pregnancy." "To leave the case to nature, is most likely to be successful, especially when the rupture happens in the early months." Of rupture during parturition, at page 478, he remarks, "when the os uteri is rigid, and very little dilated before the accident happens, and cannot be opened without extreme irritation, or when the uterus is spasmodically and violently contracted between the rent and the os uteri, I consider attempts to deliver as adding to the danger. In such cases, and in deformity of the pelvis, we must perform the Cæsarean section or leave the case to nature." "If called early, while the child is yet alive, before the abdominal viscera are irritated by the presence of the fœtus, we are warranted to extract the child by a small

incision;" and even after many hours have elapsed, he thinks gastrotomy by a small incision offers a better chance than a delivery through the rent, though he does not venture an opinion on the relative chances of gastrotomy and non-interference.

Merriman, in his *Synopsis*, (James' edition, p. 151,) says, "if some hours had elapsed after the parts had given way, or if there were a difficulty in passing the hand on account of contraction of the uterus, it would then perhaps be more prudent to leave the event to nature."

Velpeau, in *Arch. Gén. de Méd.*, tom. iii. 4th series, considers it improper to recur to extreme surgical means, until all attempts to return the child into the uterus, whether it has escaped either partially or wholly from it into the abdominal cavity, have failed.

Dewees says, when the child has escaped into the abdomen, "the delivery, *per vias naturales*, may be either difficult or impossible, even in a well-formed pelvis;" "the only chance in this case is, the immediate performance of gastrotomy; should a contracted pelvis complicate the case, the latter operation is the only alternative."

F. Ramsbotham (*Process of Parturition*), remarks, "feeling as I do, that to leave the child in the cavity of the belly is almost certain death to the mother, I should seriously entertain the question whether the parietes of the abdomen should be divided and the child extracted by that means, or whether the patient should be abandoned to the chance of what nature might effect; and the answer must depend entirely on the circumstances of the individual case. If she were in tolerably good spirits, if she had not suffered so great a shock as usual from the accident, particularly if, after explaining to her what had occurred, she were anxious for the operation to be performed, I should have no hesitation in undertaking it. But if I found her sinking, if the powers of life were ebbing fast, and particularly if thirty or forty minutes had elapsed since the rupture, and the movements of the fœtus had quite ceased, I should by no means sanction the incision, because of the painful nature of the operation, and because I should presume it would avail nothing, and might probably hasten her death."

Dr. Davis (*Obstetric Medicine*), merely says, "inasmuch as laceration of the womb is not an essentially mortal accident, such services (delivery) must unfortunately be sometimes undertaken, and therefore ought to be judiciously executed." "We should interfere without loss of time when the circumstances might appear urgent and desperate, and abstain from such interference when the nature of the symptoms might promise a probable successful issue without it."

Jacquemier (*Man. des Accouch.*, tom. ii. p. 300), says, "when the contraction of the rent or of the neck, which cannot be overcome with advantage, in case it remains rigid or imperfectly dilated, will not allow the hand to penetrate the cavity of the peritoneum, or when the pelvis is contracted to the degree of rendering the extraction of the fœtus uncertain even after diminishing the volume of the head, there remain no other resources than gastrotomy, or leaving the whole to nature." Gastrotomy, he says, offers chances of recovery less unfavourable than those of abandonment, especially if the operation be performed before symptoms of inflammation present themselves.

Dr. Robert Lee, in his late work, p. 436, advises resort to perforation when the head presents; and that when the child has passed through the rent into the abdomen, an attempt should be made without delay, to deliver by grasping the feet. "If a considerable time has elapsed after the acci-

dent, and the uterus has contracted so closely that the hand cannot be passed through the orifice and the rent, the best practice would be to leave the case to nature. Some have recommended gastrotomy under these circumstances; but the child is already dead, and the mother could hardly be expected to survive after such an operation." If the fœtus has escaped into the peritoneal cavity, the patient, he says, may recover without gastrotomy.

Colombat (*Amer. edition*, p. 236), says, "if the child have not passed entirely into the abdominal cavity, we should always endeavour to terminate labour by the natural passages; but in the contrary case, recourse must be had to gastrotomy, because this extreme means offers some chance of safety to the mother, and especially to the child, which would indubitably perish unless we should act with great promptitude."

"But what is to be done," inquires Dr. Blundell, "where the fœtus is in the abdominal cavity and cannot be reached, the child being inaccessible in consequence of the contraction of the aperture? Why, if there seemed to be a disposition to rally a little, I should feel inclined to try palliatives, if these were indicated, and I should leave the patient mainly to the natural resources." "But what if the child should escape into the peritoneal sac? and if, further, the symptoms, being most alarming, there should appear to be no hope for the woman in her natural resources? Why, in such cases, it would be for sober consideration, whether it might be advisable to have recourse to abdominal incision, provided the patient would heartily consent." The success of one case referred to by him, he thinks, offers encouragement, but he inquires in a note, does it "belong to an anomaly or a general principle?"

Dr. Collins, in his "*Practical Treatise*," is decidedly in favour of perforating the head when it presents and does not recede. "When the child has escaped out of the uterus, it is now the general practice, and undoubtedly the best, to introduce the hand through the lacerated parts into the cavity of the abdomen, and bring down the feet." "In cases where laceration has occurred previous to the os uteri being dilated, it is thought the best chance of recovery would be to open the parietes of the abdomen, cut into the uterus, and so extract the child." This, he thinks, can scarce ever occur except as the result of external violence.

Dr. James Hamilton (*Pract. Observ.*, p. 111), says, "if, from the state of the passages, the infant cannot be drawn forward through the usual apertures, the parietes of the abdomen should be divided."

Churchill (*Amer. edit.*, p. 372), says, "in some cases of ruptured uterus, when delivery is imperative, but impracticable, *per vias naturales*, the Cæsarean section has been proposed. It appears to me the additional risk from the operation, renders its propriety very questionable."

Among these, it will be seen that there is a great variety of sentiment as well as contrariety. Thus Blundell and Davis would not attempt delivery so long as there appeared to be any chance of recovery undelivered. Lee and Merriman would abandon the woman unconditionally when the rent has become diminished by contraction. Burns and Ramsbotham would be rather disposed, under these circumstances, to practise gastrotomy early, the former by a "small" incision. Blundell would wait until there should be no chance of recovery if left alone. Velpeau would try every other mode before resorting to gastrotomy. Dewees, on the contrary, says the only chance is in its immediate performance. Churchill considers its propriety very questionable. Jacquemier would perform gastrotomy where there should be so great contraction as to render it doubtful whether the fœtus

could be extracted after perforation. From the tenor of Dewees we infer that he considers it expedient in contractions of a less degree than what would absolutely prevent delivery *per vias naturales*.

These directions are given, for the most part, by those who are regarded as of standard authority; and the countenance of either would be considered a full justification for following the course recommended by him; but where there is so great disagreement as to the proper course, it is evident that they cannot be regarded as equally safe guides.

There is, then, no established rule of practice under the circumstances to which we allude. By men of equally high reputation we are advised, to abandon to nature, and to practise gastrotomy, in cases of rupture and escape of the fœtus; and when, from a contraction of the pelvis, or an undilatable os uteri, or contraction of the vagina, serious obstacles are presented to speedy delivery, some advise the removal by the natural passages of the fœtus, mutilated, while others affirm that the abdominal section affords the patient the best chance of recovery.

Since neither of these opinions can be referred to as of controlling authority, were it not for the acknowledged great fatality of the accident, under any course of management, he who practised the more heroic course would be censured by those who have taken their rule of practice from Merriman, Blundell, Davis and Lee; and the disciples of the latter charged with culpable neglect, by those who believe in the propriety of active interference.

The difference in individual opinions may arise from a mere partial examination of the subject, or from prejudice in favour of or against particular operations under any circumstances; and especially from the result of cases in which each may have happened to be personally concerned. A successful case of gastrotomy would be pretty certain to induce a repetition and recommendation of that practice under like circumstances, while an unsuccessful termination would probably discourage from a similar attempt in future.

Although rupture of the uterus is comparatively a rare accident, the determination of the practice to be pursued under all conditions of its occurrence, is a matter of the highest practical importance. If the chance for the unfortunate patient's recovery is at the best small, it surely is a matter of great moment, under circumstances of peculiar difficulty, to know what course presents the greatest probability of a favourable issue. In other words, it is our duty to inquire, which places the woman in the most favourable condition for recovery, when the fœtus has escaped into the abdomen, and the uterus is contracted—the abandonment of the patient to the resources of nature, or delivery by gastrotomy? And when, from any cause, such a disproportion exists between the fœtus and the maternal passages, as to render delivery *per vias naturales* difficult, does the prompt removal of the fœtus, by an operation itself severe, but still of very short duration, and which allows the patient almost at once to rally, or the tedious, painful, and often long protracted procedure of dragging it, mutilated, through the natural passages, afford the best chance of immediate security, and place her in the best situation for ultimate restoration to health?

Rupture of the womb is undoubtedly one of the most appalling accidents that can complicate labour. Interference must be judicious; delay may compromise the patient's existence, and improper interference may hasten the fatal end. Probably the accoucheur is never called to act under circumstances in which he feels more the need of the support afforded by well established principles of action; not only as a relief for the anxiety by

which he is oppressed, but that he may be secure from the charge of rashness on the one side, and of incapacity and inertness on the other.* It is true, that in the instances just spoken of, in a medico-legal point of view, either course of conduct is perfectly justifiable, in the present absence of unequivocal authority for one or the other; but, nevertheless, it must be admitted, that this fact is but a proof that the principles of practice should, if possible, be determined. Especially is it desirable that we should be acquainted with every circumstance that may materially affect the issue, if what F. Ramsbotham states is generally true, where he says, p. 425, "I have seldom known a case in which the uterus ruptured, where the attendant was not more or less blamed."

Such principles can only be discovered by ascertaining the collective experience of the profession at large; and this can be obtained only, by a careful comparison of the cases reported by authors on midwifery, and of such as form contributions to periodical medical literature. The great design of these contributions is, or should be, the recording of isolated facts, which, taken by themselves, may be entertaining from their unusual character, and perhaps instructive from the practical lessons they convey, but whose highest value appears only when they are taken collectively. Grouped and collated, they serve as data from which principles of practice may be determined, so soon as they have accumulated sufficiently to render such deductions safe. To be fully adapted to this important end, every case should be reported with a fullness of detail, whenever it is possible, which shall leave no essential point unnoticed. The more complete the narration of its particulars, the more available is it for the advancement of accurate information. This consideration seems not to be kept sufficiently in view by those who publish cases; and a large proportion of the histories of ruptured uterus leave many important points unnoticed. Some furnish but one or two particulars, and a large number of cases must be collected to furnish anything like a proper number of observations upon any one point. This is, however, the only mode that we have of acquiring the general history and results of the accident we are treating of, and we trust that notwithstanding its imperfections, it may lead to important conclusions. In some instances, moreover, we are aware that it is impossible to obtain all the particulars essential to a complete history.

We are not ignorant of the difficulties attending an examination of the subject in the manner proposed. So many conditions come in to modify the results, as constitution, circumstances in life, &c., that scarce any two cases admit of a fair comparison in all respects; nevertheless, we have sought to note the prominent conditions that might influence the result, and as far as possible make allowance for them.

In pursuance of our design, of ascertaining what the experience of the profession at large has shown to be the most successful course in the management of rupture of the uterus, we have examined nearly all the treatises in our language upon midwifery, diseases of women, &c., and the large collection of foreign and domestic journals in the New York Hospital Library. The monographs of Douglas, Ingleby, and Duparque, the collections of Perfect and Baudelocque, and a volume published by Dr. Dewees, of observations on particular subjects, we have been unable to obtain access to; this is to be regretted, as they would have furnished additional cases. Our grateful acknowledgments are due to the liberality of Profs. W. Chan-

* See report of a discussion upon a case in which gastrotomy was performed, in *Lond. Lancet*, 1828-9, vol. i. p. 310.

ning, of Boston, C. D. Meigs, of Philadelphia, and G. S. Bedford, of New York, who occupy distinguished positions as teachers and practitioners of midwifery, and who have kindly placed at our disposal histories of cases of rupture never before published, which their extensive experience has brought under their observation; and also to other gentlemen who have aided us by cases, and the use of their libraries.

In making the collection from Journals and authors, there has been constant necessity of guarding against recording the same case more than once, since it is not unusual to find the same quoted in several journals, in part in full, in part abbreviated; thus rendering it often difficult to be identified. Part are quoted at second hand, the originals not being accessible.

These cases were analyzed and tabulated under the heads of *Age, Health, and Condition—Character of Previous Labour—Nature of the Labour, and its Duration—Time from Rupture to Delivery—Mode of Delivery—Time occupied in Delivery, and whether difficult or not—Hernia of the Bowels, &c., accompanying it—Time from Rupture to Death or to Recovery—Post-mortem Appearances—Presumed Cause of Rupture.*

In this way, by casting the eye up and down the column, a complete view was presented of all that the whole series furnish under a given head, and an opportunity was afforded of comparing cases of the accident, occurring under great varieties of circumstance.

The abstracts thus obtained, have been compared with the histories that furnished them, twice, and in several instances oftener.

We have mentioned sources from which cases could have been obtained, to which we have not had access; there are probably others reported in the Continental journals of Europe, and perhaps in the journals of this country, which have not come under our notice; but from the frequency of quotations of cases of interest, probably not a large number have been omitted. The number collected is considerably larger than has, to our knowledge, been before brought together, being over three hundred. In consequence of the inconvenience of large tables, the analysis of each case has been copied in the form of a brief but continuous history. This abstract is published in order to present a series of cases that should exhibit the different phases which this accident may assume, as its phenomena are made to differ by conditions peculiar to each case. A much greater impression is made upon the mind by the perusal of several cases presented in succession, than by any general description, however extended it may be, or any mere statement of the proportion of instances in which given symptoms occur. Again, as the object of this inquiry is the truth, if our inferences are incorrect, the mistake may be readily pointed out. The cases being gathered from a great variety of sources, it is hardly to be supposed that the pains would be taken to recur to the original account, and many of them would be inaccessible to a large portion of our readers, if merely referred to.

We have arranged these cases, so as to bring together by themselves those occurring during gestation, and those met with during parturition. This distinction is made rather as a matter of convenience, than with reference to any essential differences in the accident as occurring under these two conditions. The rupture itself, during pregnancy, is more usually the first of the train of morbid symptoms, whereas in parturition, it usually succeeds labour pains of longer or shorter duration; and yet this is by no means universal. As exhibiting the general features of the accident when occurring during pregnancy, these cases have been grouped together; but

inasmuch as in several instances rupture has occurred when labour has come on, or been artificially induced, before the full period of gestation, this distinction could not in all cases be regarded, and has not been rigidly adhered to. We have numbered each individual case, even though it was merely referred to in the original from which it was copied; several, for example, merely state that the woman died undelivered. This statement, in *so far as it goes*, is as valuable as a more elaborate account, and such are numbered for subsequent reference.

I.—*Cases of Recovery from Rupture occurring during Gestation.*

Case I.—At the sixth month of pregnancy violent pains occurred, without any previous unusual symptoms—sudden vomiting, faintness and sense of distension of the abdomen—gastrotomy two hours after the accident. Recovered in fourteen days.—*Lond. Med. Gaz.*, vol. i. p. 101, from *Repert. Méd. Chir. di Torino.*

Case II.—A healthy peasant, æt. 35—mother of four. About seven and a half month, suffered a severe blow on the abdomen, and felt a severe tearing pain. Fœtus could be felt in the abdomen—child had ceased to live—usual alarming symptoms of rupture absent. After several days part of a putrid fœtus escaped *per vaginam*, and part was extracted, as there were well marked symptoms of metritis. After a few days the rest escaped through an opening in the abdomen five inches in diameter. Menses returned in less than two months.—*Brit. and For. Med. Rev.*, vol. v. p. 581, from *Nægelé in Neue Zeitschrift für Geburtskunde.*

Case III.—Æt. 35—when, as she supposed, five months gone, seized with uterine contractions and abdominal tenderness. Six weeks before this, after violent pumping, felt a strange sensation in the abdomen, with faintness, and did not recover strength. The tenderness continued three or four days with sharp pain; soon the fœtus could be felt in the peritoneal cavity after an attack of hemorrhage. Ten days after this a fœtus of about seven months was expelled. The placenta had partly escaped through a rent in the upper and back part of the left side of the uterus. Another fœtus could still be felt in the abdomen. After a few months she remained feeble.—*Dr. Randall, Lond. Med. Gaz.*, vol. xxix. p. 45.

Case IV.—Had undergone Cæsarean section fourteen months before. At the seventh month labour-pains came on, and symptoms of rupture, and child passed into the abdominal cavity. Between the fifteenth and twentieth day after, the cicatrix of the abdomen gave way, and a putrified fœtus escaped. Recovered.—*Brit. and For. Med. Rev.*, 1844, p. 537, from *L'Expérience*, Nov. 1843.

Case V.—Æt. 28—deformed by rickets; had been delivered by Cæsarean section. At fourth month of her next pregnancy an ulcerated spot appeared on the abdomen near the cicatrix, which, during two months, increased—a slight cracking was heard, the abdominal parietes gave way, and the fœtus escaped into the world. The direction of the rent of the uterus was unascertained, that of the abdomen was transverse. Within three months the menses returned.—*Edin. Med. and Surg. Journ.*, 1845, vol. i. p. 515, from *Allegem. Repert.*, 1844. *Dr. Præl.*

Case VI.—Æt. 36—ninth pregnancy; fell from her bed in the second month, and afterward suffered great disorder in the uterine region. Severe constitutional symptoms appeared until the tenth month, when an abscess opened in the umbilical region. The opening was enlarged, and then the fœtus extracted piecemeal. Recovery rapid; rupture probably occurred at the second month.—*Dr. Salemi*, from *Journ. de Progrès*, vol. iii., in the *N. Am. Med. and Surg. Journ.*, vol. iii. p. 252.

Case VII.—Æt. 24—unmarried; full habit; seventh month. Violent griping pains existed for three days in the abdomen, and the membranes were found ruptured. Extremely violent and distressing pains came on; the os tender and undilated. After intolerable agony, the child was expelled with great force; putrid. The posterior and inferior segment of the uterus was torn off, attached by less than two inches in front. The intestines filled the brim of the pelvis. The intestines were returned, and the lip of the cervix replaced. Condition extremely dangerous for many days, discharging immense quantities of dark offensive fluids

from the vagina. Seven months afterwards the vagina was blocked up by a very hard, insensible substance, and her health delicate.—*Mr. Wood, Lond. Med. Repos.*, vol. xv. p. 450.

Case VIII.—Nothing peculiar in the pregnancy. At seventh month seized with violent hemorrhage and slight pain, which continued and increased, and next day she was delivered by version, the shoulder presenting. On removing the placenta, the uterus was found ruptured at the posterior and inferior parts; and there was hernia of the intestines through the rent. Recovered in three weeks, and had another child.—*Mem. Med. Soc. Lond.*, in *Edin. Pract.*, vol. v. p. 584.

Case IX.—Æt. 20. In the ninth month, a sudden fainting fit and severe pain in the abdomen. Fœtus discharged through a fistulous opening in the abdomen. Recovered.—*Lond. and Edin. Month. Journ.*, 1842, from *Gaz. Méd.*, 1841.

Case X.—Rupture in fourth month; terminated by suppuration at the navel, and excrements discharged at the opening for some time.—*Burns' Midwif.*, p. 264, from *Dr. Drake*, in *Phil. Trans.*, vol. xiv. p. 121.

Case XI.—A washerwoman at Brent—rupture from a fall in seventh month—fœtus ultimately expelled at the navel.—*Ibid.*, from *Mém. Acad. Science*, 1709.

Case XII.—Sixth month; fall; rupture; immediate fainting; discharge from the vagina; child expelled *per anum.*—*Ibid.*, from *Mém. Acad. Sci.*, 1706, *Guillerm.*

II. Cases of Rupture before the Termination of the full period of Gestation, which did not Recover.

Case XIII.—Æt. 26—third pregnancy; nothing unusual in previous labours. Awakened in the morning by severe pain about the umbilicus, succeeded by vomiting, unaccompanied by pain. Died in eighteen hours after rupture.

Post-mortem.—Cavity of abdomen filled with blood; rupture at the fundus, through which the fœtus had escaped.—*Mr. Ilott, Lond. Med. Repos.*, vol. vii. p. 375.

Case XIV.—Æt. 43—twelfth pregnancy; corpulent, but active; of perfect make. Without any regular labour-pains, she suddenly had two very violent—the os hard, undilated and high up; peritonitis supervened. On thirteenth day a putrid fœtus was "extracted," after which she gained for a few days, but sunk on the twenty-fifth day from rupture.

Post-mortem.—The fœtus had escaped into the cavity of the peritoneum, and a sac had been formed around it.—*Lond. Med. Repos.*, vol. xxi. p. 327, from *Transacts. of Apothecaries.*

Case XV.—At the sixth month seized with strong pains, lasting three or four hours; motions of the fœtus ceased—death after several hours.

Post-mortem.—The fœtus swimming in blood, in the midst of the intestines—bifid uterus—rent in one division.—*Dict. des Sci. Méd.*, vol. xlix., from *Anatomie de Dionis.*

Case XVI.—At the fourth month symptoms of rupture occurred. After this she menstruated, and four months after the rupture died.

Post-mortem.—A rupture closed and cicatrized on the internal surface, but still open toward the abdomen; a fœtus was found in the abdomen.—*Phil. Med. Journ.*, vol. i. p. 80, from *Journ. de Med.*, 1780.

Case XVII.—At seventh month, after being jammed by a carriage against a wall, had at once violent pain and flooding. She languished for about five months, and died.

Post-mortem.—Evidences of great inflammation in the abdomen. Uterus natural, except a rent posteriorly which had not healed; fœtus in the peritoneal cavity, putrid.—*Ibid.* from *ibid.*

Case XVIII.—Æt. 20—married a few months; tolerable health; habitual dysmenorrhœa. After an excursion at time of quickening, seized with vomiting and syncope, and died in less than one hour.

Post-mortem.—A rent five inches long in the anterior part of the uterus from the cervix; the fœtus without the uterus surrounded by coagula; the uterus covered with dark-coloured spots, and easily torn, and both ovaries diseased. Rupture

supposed to be owing to the movements of the fœtus.—*Mr. Else, Lond. Med. Gaz.*, vol. ii. p. 400.

Case XIX.—Æt. 25—second pregnancy at fifth month; had some pain and uneasiness in the abdomen and vomited once, collapse ensued, and in a few hours she died.

Post-mortem.—A large quantity of blood in the abdomen; a rent in the superior and posterior wall of the womb, one and a half inches long; the fœtus in the peritoneal cavity; the cervix healthy; the os closed; the body of the uterus "rather thinner and much softer than natural."—*Mr. Nunn, Lond. Med. Gaz.*, vol. xxi. p. 1030.

Case XX.—Æt. 32—mother of eight; near full time had a fright, causing her to turn quickly, when she was seized with sudden pain in the back, extending to the abdomen, with faintness and palpitation. Eight days after, the same symptoms were renewed, and she died three-fourths of an hour after the birth of a full-grown child.

Post-mortem.—A large amount of blood in the peritoneal cavity; the uterus not contracted; hydatids in the right ovary; two long and one short rent through the peritoneal coats of the uterus.—*Mr. White, Dub. Med. Journ.*, vol. v. p. 324.

Case XXI—Æt. 24—at fifth month, second pregnancy, slight hemorrhage came on with pains; these recurring often, she was much reduced, and the back and feet could be felt through the abdominal walls. After a few weeks, violent pains came on; os scarce dilated; ergot given; sank exhausted.

Post-mortem.—Fœtus escaped through a longitudinal rent in the right side of the uterus, and near the cervix a second rent not through the peritoneum; the head and placenta remaining in the uterus. A great quantity of fluid, blood, coagula, &c., in the cavity. The structure of the womb rather softened; the fœtus apparently of six and a half months.—*Brit. and For. Med. Rev*, vol. vi. p. 539, from *Gaz. Méd.*, 1837.

Case XXII.—Æt. 26—had one child, and three miscarriages. At two and a half months, while waltzing, after taking a dinner, and cold bath, she felt all at once a cracking in the abdomen, and became faint almost immediately. Most alarming symptoms rapidly succeeded; abdomen became swollen and painful, and perfect collapse ensued—no hemorrhage—neck of the uterus natural. It was believed to be rupture of the liver; two colleagues afterwards called it acute peritonitis—was leeched; died about thirty hours after rupture.

Post-mortem.—A great quantity of blood in the peritoneal cavity; at the fundus was a considerable rent of a circular form, two inches in diameter; the uterine tissue healthy, except about the rent, where it was evidently softened, and the torn surface rough and unequal—the ovum in the peritoneal cavity.—*MM. Moulin et Guibert, Arch. Gén.*, 1825, p. 382.

Case XXIII.—Æt. 25—robust—at commencement of the seventh month aborted, in consequence of a rupture of the womb and the posterior wall of the bladder, into which the fœtus escaped; some bones passed away, and at the end of two months, she died of gangrene.

Post-mortem.—The uterus and bladder united by false membranes.—*Arch. Gén.*, 1828, p. 109, from *Memor. d. Math. e Phis. d. Ac. d. Sc. d. Lisboa*, vol. ii. *Dr. G. de Lousa Ferras.*

Case XXIV.—Æt. 27—fourth pregnancy; after much fatigue, had pain in her left side, followed by nausea, lasting some days, and febrile symptoms. In a little over three months seized by an unsupportable pain in the side—a tumour felt in the belly—general agitation followed by syncope and collapse—death.

Post-mortem.—Much blood in the peritoneal cavity, and a fœtus of about the fourth month. Uterus somewhat flattened, and an irregular rent, still bleeding, nearer the longitudinal axis than the Fallopian tube and ovary, which could not be found. Death from hemorrhage.—*Phil. Med. and Phys. Journ.*, vol. vii. p. 419, from *Mem. dell' I. R. Institut. del Regn. Lombard.*

Case XXV.—Mother of several. At fifth month, after a long walk, felt a sudden and severe pain, "as if something had given way within her;" tearing sensation continued; supposed to be colic. Died after several hours.

Post-mortem.—At least four quarts of blood in the peritoneal cavity, and the fœtus and unbroken secundines. A transverse rent from one Fallopian tube to the other; the os impervious. "There was no extenuation at any point of the uterus, nor any appearance of disease."—*Dr. Harrison, Am. Journ. Med. Sc.*, vol. xv. p. 371.

Case XXVI.—Æt. 28—good health; first pregnancy: at sixth month, while reaching over a flour barrel, felt something give way, and had pain in the abdomen, where she rested against the barrel, which continued. Ten hours after this she had labour pains; the os partly dilated, and in four hours delivery took place; placenta separated by the hand with difficulty; child alive. Died ninety-eight hours after delivery.

Post-mortem.—Fœtid gas escaped from the abdomen; uterus torn at the left extremity of the fundus, above and very near the Fallopian tube; the rent of the peritoneum not over three-fourths of an inch, that of the uterine substance greater. The lining of the uterus elsewhere looked well. *Ibid.*, 1845, p. 177, from *Trans. Coll. Phys. of Philad.*, 1844. *Dr. Bond.*

Case XXVII.—Had flooded in a former pregnancy. Had been tolerably well, when at the seventh month, she had a violent pain in the right side, different from what she had before felt; the pains and hemorrhage had been inconsiderable. Died in four hours.

Post-mortem—The fœtus enclosed in its membranes escaped into the abdomen.—*Ramsbotham's Pract. Observs. Case* 84.

Case XXVIII.—First pregnancy; fourth month, suddenly seized with sickness and vomiting, supposed to be owing to having eaten mackerel. Five hours afterwards her pulse was scarcely felt; her countenance pallid and distressed; hands clammy and cold; pain in the belly; no external flooding, but exhibited symptoms "of loss of blood or of lead poisoning." Died six hours after rupture.

Post-mortem.—Uterus rent in the left side; ovum escaped entire; several pounds of coagula in the abdomen.—*Ib. Case* 85.

Case XXIX.—Æt. 36—tenth labour; at about the fifth month, os beginning to dilate; pains feeble; ergot given with no effect. After twelve hours, the pulse became weak, and she was faint. Immediately delivered by the crotchet of a putrid child. Sank on the seventh day.

Post-mortem.—Adhesions of intestines; ovaries soft, and mottled with black; peritoneum raised from the left side of the uterus by coagula, forming a large black tumour; the ragged remains of the anterior part of the cervix seen, which was softened and lacerated; the body of the uterus had lost its elasticity.—*Dr. Murphy, Dub. Journ. Med.*, vol. xvii. p. 218.

Case XXX.—Æt. 33—fifth pregnancy; at fourth month, had rupture from a fit of passion, and subsequent violent exertion. Died fourteen hours after supposed rupture, of hemorrhage.—*Lond. Lancet*, 1828–29, vol. i. p. 33, from *Gaz. de Santé*, 1824.

Case XXXI.—Mother of six. At beginning of the eighth month, seized with abdominal pains and bilious vomiting; in ten hours watery discharge, with coagula, from the vagina, and eight hours after, was delivered of twins, by natural efforts. Died about ten hours, from supposed rupture.

Post-mortem.—Some ecchymosis of anterior part, and several transverse rents more or less convex toward the fundus, through the peritoneal coat only, from one and a half to two inches long, as if made by a pen-knife, and one three inches long, and two inches broad.—*Mr. Partridge, in Med. Chir. Trans.*, vol. ix. p. 72, from *Churchill's Dis. Fem.*

Case XXXII.—Æt. 36—tenth pregnancy; fifth month; pains feeble from the first; os the size of a shilling, relaxed; ergot did not increase their strength. Pulse being quick and feeble, os relaxed; head perforated; fœtus putrid; inflammation set in; death on ninth day.

Post-mortem.—Great peritonitis; sero-purulent fluid in the abdomen; a rent in the cervix in front, confined to the muscular substance.—*Dr. Collins' Midwifery*, p. 138.

Case XXXIII.—General good health; former labours favourable: sixth child. At seven and a half months, while in the act of stooping, she exclaimed, "My

dear, something has given way in my stomach; did you hear it break?" In one hour was in a state of collapse. Died immediately after the extraction of a dead fœtus.

Post-mortem.—A rent from fundus to cervix, posteriorly. No disease apparent in its texture; no cause for the rupture, unless a very slight attenuation of the portion lying in contact with several vertebræ.—*Merriman's Synopsis, Appendix*, p. 268.

Case XXXIV.—At fifth month, a retroverted womb filled the pelvic cavity; the fundus burst, and the fœtus escaped through the anus. Died. *Lond. Med. Repos.*, vol. xix. p. 207, from *Phil. Trans.*, vol. vii. p. 432.

Case XXXV.—Æt. 44—mother of twelve; labours always difficult, and premature delivery four times for contracted pelvis. At sixth month, membranes artificially ruptured; thirty hours after, labour came on; arm presented; after delay, delivered by turning; condition good. Twenty-four hours after, had a livid, anxious countenance, great pain, vomiting, and almost imperceptible pulse. Died thirty-six hours after delivery.

Post-mortem.—Extensive rent of anterior wall through the cervix, and body and bladder. Substance of the womb thick and pulpy, "evidently the seat of chronic inflammation."—*Mr. Favell, Prov. Med. Journ.*, 1845, p. 117.

Case XXXVI.—Rupture caused by forcible attempts to dilate the os uteri in an arm presentation at the seventh month. Longitudinal rent of the neck; result not stated.—*Dict. des Sc. Méd.*, vol. xlix., from *Baudelocque*.

Case XXXVII.—Æt. 17—between third and fourth month, suddenly seized with colicky pains, and soon died.

Post-mortem.—Abdominal cavity filled with blood, in which was the fœtus. Rent in the right side, from fundus near to the neck. The walls of the right side extremely thin, seeming to be little else than peritoneum, and very friable; the left natural.—*Buffalo Med. Journ.*, 1846, from *Am. Journ. Med. Sci.*, Jan. 1847.

Case XXXVIII.—Fell at the eighth month; first pregnancy; waters escaped; in thirty-six hours pains very strong; os dilated to the size of a shilling, and very rigid; breech presenting. During an examination, felt the cervix tear to the left; result not stated.—*Dr. Thompson*, in *Monthly Journ.*, 1847.

III.—Cases of Recovery from Rupture at the full term of Pregnancy.

Case XXXIX.—A healthy negress, æt. 18—first child; os undilated; head pressing violently on the perinæum. Uterus rent from the os, for six inches, toward the fundus; child expelled at the same time. Recovered, and had another child.—*Lond. Med. Gaz.*, vol. iii. p. 219.

Case XL.—Fœtus expelled through the anus; patient recovered in seven days.—*Lond. Med. Gaz.*, vol. i. p. 101, from *Repert. Med. Chir. di Torini.*

Case XLI.—Æt. 32—mother of two or three; pelvis contracted; had journeyed two hundred miles on foot; presentation natural; labour rapid; head low; birth soon expected. "A gush took place;" the head suddenly retreated, and pains ceased entirely. Complained of a constant "tearing" pain; laboured breathing; dark-coloured vomiting. The os was *undilated;* a rent in the right side of the body, running from a point at the right side of the cervix toward the fundus; the fœtus in the abdomen. The feet were seized, the head being assisted by the lever, after failure of application of forceps, about four hours after rupture. Over two hours hard labour in getting the head through the pelvis. Was well in three weeks.—*Mr. Macintyre, Lond. Med. Gaz.*, vol. vii. p. 9.

Case XLII.—Æt. 36—slight contraction of the superior strait; previous labours tedious, but safe. Strong labour; fully dilated os; head pressing on the perinæum. During a strong pain, a sudden scream and an exclamation that something had burst. Head receded. Great anxiety; irregular pulse; hiccup; dark-coloured vomiting. Between one and two hours after the rupture, delivery by the feet; very easily accomplished, the uterus affording no resistance; the fœtus lay in the abdomen. Recovered.—*Mr. Parkinson, Lond. Med. Gaz.*, vol. vii. p. 174.

Case XLIII.—Æt. 28—third labour; strong and healthy. Two months previous

had a fall, and afterward complained of pain in right iliac region. Very severe labour; breech presentation; rupture after the breech and half the trunk had passed the vulva. Delivered, after some delay, by traction on the trunk, with some difficulty; placenta artificially removed, part left behind; a good deal of hemorrhage; hernia of the intestines. Left her bed for the first time in about two months.—*Mr. Currie, ibid.*, vol. xvii. p. 854.

Case XLIV.—Æt. 25—mother of two children; shoulder presentation; first seen after rupture; version was impracticable; thorax perforated; delivered with little difficulty. Extensive rent behind at the junction of the cervix. Discharged cured in twenty-three days.—*Dr. Collins*, in *Dub. Med. Trans.*, and in *Treatise.*

Case XLV.—Æt. 30—sixth child; had been in labour seven hours; pains brisk; rupture occurred unexpectedly, when child was about being expelled. Perforator and crotchet at once employed; the uterus strongly assisted the expulsion. Very extensive rent posteriorly, and hernia of the intestines. Discharged on thirty-second day, cured. Afterward had two children; with the first, premature labour induced.—*Ibid.*

Case XLVI.—A rent in the cervix, vagina, and perinæum, caused by dragging with forceps a horribly mutilated fœtus through a pelvis which was "ascertained to be too narrow to admit the transit of a living fœtus." She "escaped" with these lacerations.—*Reported by Dr. Campbell, Lond. Lancet*, 1828–29, vol. i. p. 34.

Case XLVII.—Æt. 36—mother of several; previous labours easy; pains moderate at first, and suddenly, after about five hours, bearing down almost entirely ceased. From one to two hours after rupture, the pulse was rapid and indistinct; countenance anxious; excruciating pain in the abdomen, and a slight oozing of blood, *per vaginam*. Prompt delivery resolved on; head at the brim of the pelvis; after a fruitless trial of long forceps for one half hour, they slipped. The perforator then used, and the fœtus found hydrocephalic; delivery at once finished; two pounds of coagula removed. A rent from the cervix, posteriorly up into the body of the womb, as far as the finger could reach; great prostration followed, but she recovered.—*Dr. Campbell, Edin. Med. and Surg. Journ.*, 1828, p. 328.

Case XLVIII.—A stout young woman; rupture in severe labour, which lasted thirty hours. Nearly four feet of intestines protruded through the rent, and sloughed off on the sixth day; fæces voided *per vaginam* for two years, when they took the natural channel. Eighteen months after this she conceived, and had a living child.—*Lancet*, 1828–29, vol. i. p. 35, from *Dr. McKeever's work.*

Case XLIX. (*a*).—Operated on twice successfully by gastrotomy, after rupture and escape of the fœtus. The second time the fœtus lived half an hour after its extraction.—*Ibid.*, from *Pathol. Chirurg.*, vol. ii.

Case L.—Æt. 33—feeble; fourth pregnancy; fell two weeks before labour. A transverse rupture of the fundus took place; fœtus escaped. Gastrotomy twelve hours after rupture; child dead. Liquor amnii and blood in the abdomen, the intestines inflamed. Cured in about one month.—*Quart. Journ.*, 1819–20, p. 226, from *M. Bernard, &c.*, in *Journ. Compl. de Dict. des Sc. Méd.*, 1819.

Case LI.—Æt. 30—very weak; partial prolapsus. First stage natural, contractions very powerful; os dilated to half an inch, and the head in the pelvic cavity, when suddenly, during a pain, the lower part of the uterus prolapsed. A large, fleshy, cylindrical mass, six inches long, and two and a half in diameter, occupied the vagina. The head being engaged in the inferior strait, the os dilated to an inch, the forceps were applied, and the cylinder began to burst; forceps withdrawn; child expelled. The rent did not seem to pass through the uterine walls; uterus was returned into the pelvis. Recovered.—*Lond. Lancet*, 1828–29, vol. i. p. 647, from *Siebold, Journ. für Geburtsk.*

Case LII.—Æt. 20—in ninth month; suddenly fainted, and had intense pain in the abdomen, with very strong movements of the fœtus, for twenty-four hours. Pains in the hypogastric region continued intense for four weeks. Fœtus discharged piecemeal through the abdomen and the vagina; recovered after several months.—*Lancet*, 1841–42, vol. i. p. 97, from *M. Richter*, in *Austrian Med. Weekly Writ.*

Case LIII.—Previous labours favourable but the last, all the children living.

Pains had ceased for some time; patient pallid, and looked very ill; no hemorrhage; head had somewhat receded; child could be felt in the abdomen; shock of the rupture less than usual; delivered by forceps without the least difficulty. A large rent in left side, with hernia of the bowels. Recovered.—*Dr. Murphy, Dub. Med. Journ.*, vol. xv. p. 489.

Case LIV.—Was suddenly alarmed by report of a pistol, and felt an extraordinary sensation. A few hours afterwards, voided blood in her urine. Twenty-eight hours after, profuse hemorrhage came on; the os being undilated. About thirty-two hours after rupture a horizontal rent in the posterior parietes of the uterus being ascertained, she was delivered by version. Recovered in a few weeks. Good constitution, and her mind was particularly tranquil. *Dr. Ingleby, Lond. Lancet*, 1839–40, vol. i. p. 635.

Case LV.—Æt. 24—infirmary patient; low stature; deformity of extremities; about 12 hours after the beginning of labour rupture took place, the os being the size of a crown-piece, after violent pains, which were succeeded by excruciating pain in the belly. Fœtus escaped into the abdomen. About 15 hours after rupture, delivery by turning and perforation. Rent along the whole course of the right side, including the cervix. Well in about two months.—*Mr. Powell, in Med. Chir. Trans.*, vol. xii. p. 528.

Case LVI—Æt. 29—delicate; mother of three; the last labour tedious; pelvis under average; pains strong and frequent; os dilated. Within twenty-four hours from the first of the labour, a most violent pain came on, succeeded at once by vomiting and exhaustion, and pains gradually ceased. About three hours after rupture, there being constant pain, extreme tenderness and prostration, the perforator was tried; the head retreated; version and perforation behind the ear; nates and trunk delivered not without considerable difficulty; hernia of the bowels. In seven weeks was about the house, and afterward menstruated regularly.—*Mr. Birch, Med. Chir. Trans.*, vol. xiii. p. 361.

Case LVII.—Æt. 40—stout, healthy, well made; mother of nine; the last labour protracted, with sloughing of the vagina and bladder; pains sharp, severe and quick; rupture about seven hours after labour begun. The os was adherent to the vagina under the pubis, and near the size of a crown-piece, and undilatable. Had a pain as if "a sword had been thrust through her;" profuse hemorrhage; pains ceased. Between one and two hours after rupture, the os was incised, and version performed, and perforation behind the ear. A rent of three inches across the posterior wall; the edges extremely thin; well in about one month.—*Dr. Smith, ibid.*, p. 373.

Case LVIII.—Æt. 32—mother of six; always had difficult labour; pelvis narrow. At full time pains strong; waters discharged; labour progressed slowly. After a while the head was easily reached; pains gone; limbs of the fœtus obscurely felt in the abdomen; fœtal heart inaudible: face flushed; eyes bright; great thirst; vomiting and frequent cough; increased heat of skin; clammy sweat; pulse 95, hard and full. After eight hours more, symptoms the same; the pulse 100; the fœtus easily felt through the abdominal walls; the head risen above the brim and beyond reach. Gastrotomy; child dead. In six weeks perfectly cured.—*Ranking's Abstract*, vol. ii. No. 1, from *La Nouv. Encyclo. Sci. Med.*, Jan. 1846, p. 70. *Dr. Kuhne de Thever.*

Case LIX.—Æt. 24—fœtus required extraction by version. After removal of the placenta a rupture of the womb discovered, with hernia of the bowels; bowels returned, and kept up by a sponge. Recovery.—*Ibid.*, from *Caspar's Wöchenschr.*, 1845.

Case LX.—Æt. 38; mother of six; suffered severe pain in the lower part of the abdomen for last six months. Labour favourable for twelve hours, then sudden prostration; head receded when forceps applied; delivered by crotchet; rent at anterior part of the cervix. Well in one month.—*Dr. Mitchell, Dub. Med. Journ.*, vol. xxii. 1843, p. 339.

Case LXI.—Gastrotomy three hours after rupture: menstruated in six months afterward.—*Brit. and For. Rev.*, 1844, from *Bulletin de l'Acad. Roy. de Méd.*, Sept. 1843.

Case LXII.—Æt. 44—mother of five; ninth month. Labour commenced; while standing up became faint, and vomited; had a sense of laceration, and a feeling as if there were two children in the abdomen; abdomen swelled; vomiting continued; breathing irregular; os undilated. Two hours after rupture, gastrotomy performed; child extracted alive. Recovered in forty days.—*Dr. Frank, Omodei Annali, Gennajo,* 1825, in *Anderson's Quart. Journ.*, vol. ii. p. 661.

Case LXIII.—Æt. 33—eleventh child; has projection of the sacrum; the antero-posterior diameter of the brim being from two and a half to three inches. Ergot was given as in former labours; pains became violent; rupture when in labour ten hours; hemorrhage; the pains at once ceased. Turning about nine hours after rupture; the head assisted by the crotchet; the child and placenta were in the abdomen; the fundus contracted, and the body flaccid. Rent on the right side extending over in front obliquely to the left, of about three inches. Recovered in four weeks.—*Dr. Hendrie, Am. Journ. Med. Sci.*, vol. vi. p. 35.

Case LXIV.—Fourth pregnancy; at full term; after thirty hours of frequent and strong pains, she experienced an extraordinary sensation, and delivery did not take place, although the pains continued. Two months after this the fœtus escaped through several ulcerations in the walls of the abdomen, and after some months was well.—*Dict. des Sci. Méd.*, vol. xlix. p. 240, from *Hist. de la Soc. Roy. de Méd. Journ.*, i. p. 308.

Case LXV.—Rupture; delivery by version; recovery, and subsequently became pregnant.—*Ibid.*, p. 245, from *Dr. Douglas.*

Case LXVI.—Rupture; delivery by version; rent felt by the hand employed. Recovered.—*Ibid.*, from *Gaz. de Méd.* for 1778.

Case LXVII.—Rupture caused by a violent blow over the uterus; the child lay in the left side of the abdomen, and was "extracted." Recovered, and had another child.—*Ibid.*, p. 245, from *Commentaries of Leipsic.*

Cases LXVIII., LXIX.—At the commencement of labour rupture took place; everything announced the escape of the fœtus into the peritoneal cavity. She had suffered a very severe pain, and felt something tear; the fœtus mounted high in the belly and moved actively. After a while the motions ceased, and soon a sensation of all pains; prominence of the belly very manifest. The womb was separated in great part from the vagina, and hernia of the bowels; no hemorrhage or other unfavourable symptom; child and placenta extracted with facility. The abdomen swelled on the second or third day; some vomiting; lochia scanty. Recovered. Two years afterward rupture occurred again; the head had not escaped from the pelvis; delivered by forceps. Recovered—both children dead.—*Ibid.*, from *Duncan's Annals,* 1798.

Case LXX.—A woman of Toulouse had rupture during the pains of a very tedious labour. Fœtus passed into the abdomen, and remained for twenty-five years. After her death the fœtus found invested in false membranes, and *the rent by which it had escaped was distinctly visible.*—*Ibid.*, p. 247, from *Bayle.*

Case LXXI (*a*).—Womb ruptured towards the end of labour, and the fœtus passed into the abdomen. The bones passed away *per anum.* Recovered.—*Ibid.*, from *Mem. Acad. Sci.*, 1720.

Case LXXII.—About twenty-two years after its supposed escape into the abdomen, the fœtus escaped *per anum.*—*Ibid.*, from *Percival.*

Case LXXIII.—Rupture and escape of the fœtus into the abdomen. Became pregnant a second time, extra uterine, at the end of seven years, during which time the fœtus was in the abdomen. At the end of twenty-one years she began to void the bones of both *per vaginam;* the discharge continued during eighteen years.—*Ibid*, from *Underwood.*

Cases LXXIV., LXXV., LXXVI., LXXVII.—Bartholeu cites two cases in which the fœtus escaped by ulcerations in the abdomen, and two by the intestines, of which three recovered.—*Ibid.*

Case LXXVIII.—Thérèse Allard had rupture, October, 1776, and four months after, the child was removed by a great incision, she being in great danger from the effects of putrefaction.—*Ibid.*

Case LXXIX.—Perceiving a faintness succeed a violent movement, when a long time in labour, the surgeon, on examining, could no longer feel the fœtus. Gastrotomy; mother and child saved.—*Ibid.*, p. 249, from *Mem. de la Soc. Roy. de Méd.*

Case LXXX.—Wife of a carman; child escaped into the peritoneal cavity; preparations made for gastrotomy, but it was resolved first to attempt delivery by the natural passages. The flaccidity of the lips of the rent, and the favourable position of the feet, permitted delivery, which was accomplished with as great facility as usual.—*Ibid.*, p. 253. *MM. Gardien, Desseaux, &c.*

Case LXXXI.—Third labour; at full term. On the escape of the waters the os was scarcely opened; pains came on; head presented. In a few hours everything promised speedy delivery, when she complained of a singularly acute pain of but short continuance, in the superior and lateral part of the abdomen, after which the fœtus and placenta escaped. Gastrotomy at once practised, and occupied only four minutes; the child was dead; considerable blood in the *bas ventre;* recovery favourable; cure complete on the thirtieth day.—*Heister's Surg.*, tom. v., from *M. Thibault*, in *Journ. de Méd.*, 1768.

Cases LXXXII., LXXXIII.—Wife of a vine-dresser; rupture and gastrotomy at the end of eighteen hours; child dead; a gangrenous abscess formed in the hypogastric region; but she was at work in the field in six weeks. At the end of nine years again pregnant, and had rupture of the womb, the fœtus escaping entirely into the abdomen. Gastrotomy again, only waiting for the administration of the sacrament, two hours or more. Infant gave signs of life for half an hour after the operation. The woman subsequently had a child naturally.—*Dict. des Sc. Méd*, xlix. p. 255, from *M. Lambron, Observ. Communiquée à l'Acad. de Chirurg.*

Case LXXXIV.—Mr. Dumay resorted to gastrotomy in a case of rupture, and on the thirtieth day the wound was the size of a two sous piece.—*Ibid.*, from *Baudelocque, Recherches sur l'Operation Césarienne*, p. 38.

Case LXXXV.—A poor woman fell from a cart, in consequence of which the uterus was ruptured, and the child passed into the peritoneal cavity; bones of the pelvis so *mashed* as not to allow of delivery. Gastrotomy was performed. Recovered. *Dewees' Essay*, in *Phil. Med. and Phys. Journ.*, vol. i. p. 77, from *MS. Lectures of J. Hamilton.*

Case LXXXVI.—Had several children; full time; labour slow at first, but pains became more violent, and during one, felt something crack within her. Pains ceased; became faint; pulse intermittent. Apparently quite torn; she was delivered; the child small, *very healthy and lively.* One side of the uterus burst so wide as to admit the hand.—*Ibid.*, from *Burton's Syst. Midwif.*, p. 110.

Case LXXXVII.—Æt. 21—at full term had very violent pains continuing three weeks. About six months after, she discharged from a small rent at the navel, near four gallons of water, with some "fleshy strings and small bones." The opening was dilated, and the bones of two fœtuses extracted; menstruated two months after, and was pregnant five months after, and six times since.—*Ib.*, p. 82, from *Med. Comment., Amer. edit.*, vol. i. p. 103. *Dr. Bell.*

Case LXXXVIII.—Exostosis of the pelvis; rupture; gastrotomy; mother and child saved.—*M. Castelli, Archives Gén.*, vol. lxiii., 1845, from *Repert. Acad. Roy. de Méd.*

Case LXXXIX.—Æt. 38—mother of three; previous labours severe. Deformed pelvis from too great inclination of the superior strait. Pains came on upon the 27th, waters broke on the 28th, and os dilated on the 29th; no signs of danger; sudden indefinable sensation in the abdomen, with change of its form, and the fœtal limbs could be felt. Expulsive pains ceased; collapse; some hemorrhage. Turning easily done, the head being assisted by the forceps; rent felt by the hand during version. Recovered in a month.—*Gaz. Méd.*, 1845, p. 311, *M. Colson.*

Case XC.—Æt. 37—mother of seven; two labours tedious; the rest natural; sacrum prominent. Five months before fell back in a chair, but was well after it. Pains very frequent and strong, and after twelve hours, membranes were artificially ruptured. In a very strong pain she had a peculiar feeling in the abdomen, and suddenly cried out that something had burst within her; collapse

ensued. Turning immediately, the head being assisted by the lever. Rent transverse; an internal abscess burst *per anum*, and she recovered. Fifteen months after, again confined.—*Edin. Med. and Surg. Journ., July*, 1833, p. 72. *John Dunn.*

Case XCI.—Æt. 30—mother of six still-born; each labour long and painful; children born alive; diameter of brim scarce three inches. Great œdema of anterior lip of uterus; belly prominent; for eighteen hours the pains were of little strength; then excessive cramps came on, and vomiting, the head being at the brim. Labour lasted thirty-five hours. Fearing rupture, the head was perforated; delivery occupied two hours. A rent of two to three inches in the posterior part of the neck, apparently not involving the peritoneum. Recovered.—*Mr. Robertson, Ibid.*, for 1834, p. 51.

Case XCII.—Æt. 35—eighth pregnancy; previous labours hard; pelvis "under the standard dimensions." After six hours' labour, the pains having become very severe, rupture took place; there were hemorrhage, extreme tenderness, sense of sinking, and hurried breathing; fœtus and placenta escaped into the abdomen through a rent in the left side, somewhat behind. Delivered by version. Recovered, and became pregnant.—*Ibid*, from *Mr. Stephens.*

Case XCIII.—Æt. 28—brim not over three inches in its short diameter; had been in labour forty hours; pains incessant; great suffering; perforation; the base of the skull with some difficulty drawn into the pelvis; cervix ruptured posteriorly for two inches, both longitudinally and transverse. Was well in eight weeks.—*Ibid.*, p. 55.

Case XCIV.—Æt. 37—small; antero-posterior diameter of brim two and three-fourths inches; first delivery was by perforation. After twelve hours of continued strong pains, the os dilating well, the pains ceased suddenly; had a sense of stabbing in the belly, which lost its form; the head retreated; no alarming symptoms at the time. Next day, the skin was cold; pulse feeble, 85 to 90; intestines felt at the brim; placenta and membranes and fœtus in the peritoneal cavity. Twenty-three hours after rupture, gastrotomy performed; occupied not over five minutes; expressed herself much relieved at once. A longitudinal rent of the left side. In one month menstruation was established.—*Arch. Gén.*, vol. xxxviii. p. 506, from *Allgem. Med. Zeitung*, 1833. *Dr. Molitor.*

Case XCV.—Æt. 35—healthy; eleventh child. After several hours, the os dilated; head pressing on the perinæum; had acute pains; became restless and anxious; cold sweats; nausea; and violent liquid purging. After some time, the head found receded; rupture not discovered till it was considered too late for delivery. During a few weeks the fœtus passed partly by the vagina, and partly removed by an incision in the abdomen. In about ten weeks perfectly well.—*Lond. Med. Repos.*, vol. viii. p. 110. *Mr. Brock.*

Case XCVI.—Æt. 22—second child; full time; previous labours of great suffering, and instrumental. Pains powerful and frequent; no dilatation; had been so for several hours. Suddenly the fœtus was forced through the anus, and fell on the floor. Rent through the posterior part of the uterus into the rectum; the os a firm cartilaginous ring. Recovered.—*Ibid.*, vol. xix. p. 206. *Mr. Gaitskill.*

Case XCVII.—Æt. 33—pelvis roomy; after considerable bodily exertion, membranes suddenly burst, and two days after labour came on. After twelve hours more, the head low in the pelvis, suddenly cried out something had burst, followed at once by hemorrhage and vomiting and excessive pain, with cessation of uterine contractions; the head receded. Forceps applied after seven hours, and slipped, and the fœtus escaped into the abdomen; version was effected with some delay; rallied immediately after delivery: rent transverse above the pubis. Recovered. —*Hamilton's Select Cases, Edin.*, 1795, p. 138. (Since Hamilton, in his *Pract. Observations*, in 1836, remarks that he had met with but one instance of recovery, this case must be the one quoted by Dewees, in the essay *sup. cit.* from Hamilton's MS. lectures, where he says it was "a case in which almost every circumstance was unfavourable," for, on bringing the child through the lacerated parts, he felt it tear more; she had children afterwards.)

Case XCVIII.—Æt. 36—primipara; pains very strong, and increasing for the

first seventeen hours; os partially dilated; head in the pelvis, but not progressing; seized with excruciating pain, gave a loud shriek, and fell asleep. Awakened after a quarter of an hour, with brown vomiting, and was plainly sinking. At once delivered by forceps in a short time; child saved; well in three weeks.—*Mr. Haden, Trans. Soc. Lond., for Med. and Chir. Improvement*, vol. i. p. 184.

Case XCIX.—Æt. 39—strong and healthy, but lately weakened by peripneumonia; pelvis narrow; fifth labour; after the escape of the waters, was very restless and irritable, with great anxiety for a few hours. During the last pain felt something slip out of its place. Vomiting ensued and quick pulse; duration of labour presumed less than six hours. In apparently less than three hours, the perforator was used; it slipped, and version resorted to, followed by perforation. Got well.—*Lond. Med. and Phys. Journ.*, vol. xix.

Case C.—Mother of seven; when one hour in labour she gave a piercing cry; pain in the right side; face pallid and sunken; pulse depressed; head retreated; turning easy; hernia of the bowels. Cured in fifteen days.—*Dubois*, from *Chailly, Amer. Trans.*, p. 267.

Case CI.—Arm presentation; rupture; turning accomplished with great difficulty; hernia of the bowels; extensive rupture of the cervix. Recovered.—*Burn's Midwifery*, p. 480, from *Trans. Phys. Dub.*, vol. ii. p. 15.

Case CII.—Contracted pelvis; rupture; child escaped; uterus contracted; turning; a large transverse rent opposite the bladder. Recovered in a few weeks.—*Castle's Blundell*, p. 704.

Case CIII.—Robust; became pregnant after a fracture of the pelvis, producing contraction; rupture; gastrotomy; only the muscular substance was torn: the peritoneum divided by the scalpel. About work in two or three weeks.—*Mr. Barlow*, in *ibid.*, p. 705.

Case CIV.—Primipara; delivered by craniotomy after a very lingering labour; placenta adherent, and on introducing the hand seven and a half hours after, it passed through a rent in the back of the vagina or cervix into the abdomen; placenta separated; a very fœtid discharge; eventually recovered.—*Ramsbotham's Process of Parturition, note* to p. 421.

Case CV.—Eight days after rupture, the fœtus was sought for in the abdomen, through a rent at a point between the neck and the body of the uterus; it was small, flabby, extensible, but complete; gas escaped with noise and at intervals; moderate fever lasted some days, but the peritonitis diminished; a mucous discharge, and pains about the kidneys continued. Entered the hospital July 6th, the tenth day of labour, and left cured on the 15th.—*Mad. Lachapelle.* See *Man. des Accouch. etc., par J. Jacquemier*, tom. ii. p. 299.

Case CVI.—Æt. 36—in labour thirty-nine hours, with a very rigid os; pains intensely violent; felt something snap, and a noise heard by an attendant; pains suddenly ceased; collapse; delivered by the vectis. Among the coagula, the portion of the uterus containing the os, and an irregular part of the cervix surrounding it, were found. For three weeks a continuous cavity between the uterus and vagina. Recovered.—*Med. Chir. Trans.*, vol. ii. *Mr. Scott.*

Case CVII.—Sixth child; labour of seven hours; ten hours after delivery, two-thirds of the labia of the os protruded from the vulva: this was separated by torsion, and the whole filled the cervix. Recovered.—*Dr. Kennedy, Dub. Journ.*, vol. xvi. p. 154.

Case CVIII.—Primipara; labour tedious from congested and undilated os; pelvis rather under-sized; posterior lip separated, and was removed. Recovery tedious. —*Ibid.*

Case CIX.—Os undilatable, after many hours of labour, after a violent pain, the circle of the cervix was torn off, and the head expelled.—*Mr. Carmichael, Ibid.*, p. 54.

Case CX.—Antero-posterior diameter of the pelvis somewhat contracted. In two labours delivered by forceps; in the third she felt something give way, and version was resorted to: eventually the trunk was removed, and gastrotomy practised, in order to remove the child's head. A slight rent was found in the

uterus; this was enlarged, and the head delivered. Recovered. For further particulars see case CCLI.—*Am. Journ. Med. Sci.*, Oct. 1843, p. 365, reported by *Dr. Bowman.*

Case CXI.—After two or three days of pain, the os uteri considerably dilated, and labour progressing, when two or three gallons of water escaped. After this she suffered extremely; belly swollen and painful; pulse quick and feeble, &c. After several hours ergot was given, with no effect. After some hours these symptoms were relieved, and the head could be felt in the abdomen. On the twelfth day offensive discharges from the vagina; fourteen months afterward was feeble, in bad health, and discharged bones, &c., *per vaginam.* At the end of about seventeen months a fistulous opening found in the abdomen; at the end of twenty-one months the bones of the cranium, &c., removed by an incision. At the end of two years was quite well.—*Dr. Toy, ibid.*, vol. vi. p. 33.

Case CXII.—Æt. 37—good health and constitution; mother of seven; waters escaped for forty-eight hours; pains short and violent; after an attempt to return the hand, which descended by the head, the womb ruptured; extreme prostration; head receded. Forceps tried and failed; then version; feet and breech in the belly; rent transverse to the right, four or five inches long. Recovered; and in five weeks was about the house.—*Dr. Guernsey, N. Y. Annalist*, Oct. 1846, p. 37.

Case CXIII.—Æt. about 30—mother of several; dangerous hemorrhage; os the size of a crown-piece, and very thin. "When stretching the os, which felt thin and rigid like a piece of parchment, the woman shrunk from the side of the bed, which obliged me to dilate with more force than I intended," when the os was felt to tear at the side, and allow the hand to pass; delivered; child lived. Recovered.—*Smellie's Works*, vol iii. p. 139.

Case CXIV.—Distorted pelvis; second child; after the birth of the child, the vagina found torn from the right side of the os for two or three fingers' breadth, and the os a little torn. Recovered; delivered again, and a large gap or chasm then detected at the side of the os.—*Ibid.*, p. 383.

Case CXV.—After pains, which continued during three days, two loud cracks were heard, as if the rafters had broken, and the belly was rent from near the navel obliquely downward; child and placenta expelled through it; the intestines seen. Recovered.—*A. Monroe, Sen.*, in *New Edin. Essays*, vol. ii. p. 338, in *Dub. Med. Journ.*, vol. xxvi. p. 492.

Case CXVI.—Æt. 32—second child; never had any uterine disease: when in labour twenty-two hours, during a strong pain, felt something suddenly give way within her, seeming as if her bowels had been torn. A calm succeeded; two hours after, pulse small and thready; respiration slow and regular; acute pain in the belly, and a sense of a rolling, crushing weight there; limbs of the fœtus easily felt, and grasped through the parietes; strength failing, she was, after a little over two hours, delivered by forceps; child lived a few minutes. A rent in the fundus admitted the hand; hernia of the bowels; a knuckle of the gut was reduced the second day. Recovered.—*Dr. Robiquet*, in *Annales de la Soc. de Méd. de Gand.*, quoted from *Journ. de Méd. et Chirurg.*, July 1846, in *Am. Journ. Med. Sci.*, April, 1847.

Case CXVII.—Four years after rupture a gangrenous abscess formed, which was opened, and a part of the fœtus withdrawn, part having been already evacuated by the bowels.—*Dict. des Sci. Méd.*, vol. xlix., *by Cornac of Vienna.*

IV. Cases of Rupture at Full Term proving fatal.

Case CXVIII.—Contracted pelvis; in three labours perforation required. At about the seventh and a half month, fifth pregnancy; delivery brought on by piercing the membranes; rupture; head escaped into the abdomen; turning and perforation behind the ear. Died.—*Lond. Med. Gaz.*, vol. iii. p. 32. *Mr. Doubleday.*

Case. CXIX.—Æt. 43—eleventh child; contracted pelvis; previous labours severe and dangerous. Pains unusually severe; in a terrible pain the uterus burst, and a sound was heard by the attendants. Died in two hours.

Post-mortem.—Rent from cervix to fundus.—*Ibid.*, vol. v. p. 522. *Mr. Spackman.*

Case CXX.—Æt. 28—fifth child; membranes ruptured; head presented; faint pain and cramp in the side. Died in less than one hour from the rupture, undelivered.

Post-mortem.—Two quarts of bloody serum in the pelvis; head firmly impacted; parietes of the uterus remarkably thin at the rupture.—*Ibid.*, vol. viii. p. 304. *Dr. Smith.*

Case CXXI.—Æt. 40—eleventh child; for two weeks had severe pain in the lower part of the abdomen, with tendency to sickness; pains tolerably strong; duration eight or nine hours; no physician called for an hour and a half after rupture. Died undelivered in less than two hours.

Post-mortem.—Two rents; that portion of the uterus thinner than the rest, and evidently in a morbid condition; patches of lymph between the peritoneum and muscular fibres; fœtus within the uterus.—*Ibid.*, vol. xxii. p. 375. *Mr. Reid.*

Case CXXII.—Æt. 32—stout and healthy, and had five children. Had a favourable labour; the head nearly resting on the perinæum. On the discharge of the waters the pains ceased, and delivery was soon required; but no positive signs of rupture, or premonitory symptoms; forceps tried and failed; delivered in a few minutes by perforation, somewhat less than two hours after rupture. Died about two hours after rupture.

Post-mortem.—Two pounds of dark coagula in the abdomen; a longitudinal rent of four inches in the posterior part; coats of the uterus healthy, but destitute of blood.—*Ibid.*, vol. xxvi. p. 347. *Dr. John Jackson.*

Case CXXIII.—Æt. 21—healthy looking; former labours easy; pelvis sufficiently roomy; os dilated; pains lively, not violent; face to the pubis; waters escaped; head gradually advancing, and a prospect of a safe delivery; a sudden scream, and complaint of a peculiar excruciating pain; pains soon ceased; rupture evident; duration of labour about ten hours; perforation at once; delivered with little difficulty. Died eleven days from rupture.

Post-mortem.—Rent two and a half inches in the anterior part; inner surface of the womb mottled by greenish patches; uterus thinned at the place of the rent. Presumed cause of rupture, partial atrophy of the uterus.—*Dub. Med. Journ.*, vol. vii. p. 209. *Dr. Murphy.*

Case CXXIV.—Æt. 36—delicate; eleventh labour; seven premature, three alive; pelvis undersized, but not irregular; no unusual sharpness of the brim. Labour at first natural; three hours and more before rupture, the pains became weak; an hour and a half after the escape of the waters, a sudden lancinating pain, "as if a sword had passed through her groin." Rupture soon evident; head between the ischia; duration of labour about nine hours. Forceps tried and failed; perforator; child slowly removed; the uterus assisting the breech and lower extremities. Died on the eighth day.

Post-mortem.—A transverse rent of three inches in the anterior part of the womb; "no morbid lesion to explain the accident." Death caused by the hemorrhage. —*Ibid.*, p. 211.

Case CXXV.—Had one living and one still-born child; sacrum prominent; antero-posterior diameter of the brim not over three and a half inches. Strong, steady pains after the escape of the waters; head fixed at the brim, and the uterus felt hard as if spasmodically contracted; felt something give way, and pains became mere spasms; no discharge from the vagina. Delivered by crotchet, apparently soon, "with much difficulty," "the uterus affording no assistance." Did not recover from the shock. Died thirty hours after delivery. Duration of labour fourteen hours.

Post-mortem.—A circular opening in the cervix opposite the sacral promontory; and a patch reaching into the body of the womb, much thinned.—*Ibid.*, p. 213.

Case CXXVI.—Æt. 36—tenth labour; five still-born; ischia closer than natural; antero-posterior of the brim four and a half inches. The os soft—head almost arrested between the ischia during four hours before symptoms of exhaustion required delivery—duration of the labour not over twelve hours. Crotchet—child large—the uterus assisting the body and legs—uterus well contracted. Sank and died in apparently less than thirty hours.

Post-mortem.—Some shreds of lymph partly adherent, and part swimming in bloody serum about the cervix. A circular opening posteriorly, near the size of a half crown; cervix thin, not softened; body of the uterus had a soft doughy feel; no unusual prominence of the sacrum.—*Ibid.*, p. 214.

Case CXXVII.—Æt. 30—fifth child; face presentation; natural labour and delivery; rupture unsuspected. Died of peritonitis on the sixth day.

Post-mortem.—Blood and serum in the abdomen; peritoneum of the uterus thickened; rent of three inches in the left side, exposing a cavity in the fibrous structure of the uterus communicating with the lining membrane, by three openings—coagula around and within it.—*Ibid.*, p. 219.

Case CXXVIII.—Æt. 26—sixth child; the first delivered by the crotchet; the third, forced delivery; the second, fourth and fifth, natural. Antero-posterior diameter of the brim three and a half inches. Labour strong; os nearly fully dilated; head resting on the pubis; without any sudden exclamation or complaint, the pains went off; pulse became weak; countenance anxious; respiration laboured; dark-coloured vomiting. Perforation at once; the uterus assisting the body and limbs. Died of peritonitis on the third day.

Post-mortem.—Intestines, and peritoneum of the uterus, highly vascular. Rent in the peritoneum of two and a half inches in the anterior part of the cervix, where was softening, and a cavity in the substance opening through the rent into the abdomen; at the rent the peritoneum raised, and lying loose between the womb and bladder; fundus soft and doughy; fibrous structure easily peeled off.—*Ibid.*, p. 220.

Case CXXIX.—Æt. 30—first child. Delivery required by her situation when admitted. Died twenty-four hours after delivery.

Post-mortem.—Uterus rent at the anterior part of the cervix close to the vagina, in a portion which was of a dusky green, and softened—of which there was a broad patch embracing the entire thickness of the walls. The peritoneum was raised in one place by coagula beneath.—*Ibid.*, p. 221.

Case CXXX.—When in labour some hours, a powerful dose of ergot was given by a midwife without regard to the os, which was extremely rigid. Uterine action was most violent; after some time prostration ensued, and she very soon expired.

Post-mortem.—A large transverse rent posteriorly, and at the neck; the fœtus and a few ounces of blood in the abdomen.—*Lond. Med. Gaz.*, vol. xxvii. p. 372. *Mr. Coward.*

Case CXXXI.—Æt. 40—not very strong; tenth pregnancy; repeated losses of blood from placenta prævia. When the child was half-delivered by version, the uterus ruptured. Duration of labour about twenty-four hours; died soon. No post-mortem, but the uterus was as thin as paper.—*Lond. Lancet*, 1827–8, vol. ii. p. 110.

Case CXXXII.—Delivered by natural efforts; child born alive. Patient died from flooding.

Post-mortem.—A longitudinal rent in the side. *Dr. Blundell.—Lond. Lancet*, 1828–9, vol. ii. p. 384.

Cases CXXXIII., CXXXIV., CXXXV.—One died thirty-six hours after rupture, with a laceration in the posterior part of a hand's breadth. The second died at the end of thirty-eight hours. The third died in less than twelve hours; the child escaped into the belly; rent in front.—*Ibid.*

Case CXXXVI.—Pelvis greatly distorted; Doctor found she had bled profusely; was restless; had weak intermitting pulse; no vomiting; uterus extremely relaxed; the child in the abdomen. Turning; considerable difficulty in extricating the shoulders and head. Survived delivery but a few minutes.—*Lond. Lancet*, 1831–2, vol. i. p. 830. *Mr. Wisbey.*

Case CXXXVII.—Exostosis of one of the pelvic bones; hydrocephalic fœtus; labour had been suffered to continue for many hours. Rupture; died without any attempt to extract the fœtus.

Post-mortem.—Several rents; an extensive one in the body, through which the

whole fœtus, except the head, had escaped.—*Dr. Campbell. Lond. Lancet*, 1828–9, vol. i. p. 35.

Case CXXXVIII.—Third labour; narrow pelvis. Duration of labour thirty-three hours; lived nine hours after rupture; died undelivered.

Post-mortem.—Very extensive rent in the anterior part of the body of the womb, through which almost the whole of a pretty large male fœtus had passed; the fundus well contracted; head impacted firmly.—*Ibid.*, p. 35.

Case CXXXIX.—Fifth pregnancy; full time; had dull and continued pain in the abdomen; waters escaped, and uterine action was very much abated. At the end of three hours, gave three ordinary doses of ergot; action increased in a small degree for one and a half hours, when the vectis was used, but failed; fœtus then considered hydrocephalic; head suddenly receded, and pains at once ceased; sinking came on; rupture had taken place, and the fœtus had escaped into the belly, and could be felt there. Apparently soon, the uterus was found permanently contracted, admitting but two fingers; patient exhausted, and but few hopes could be entertained of recovery. Gastrotomy—this occupied thirty seconds, without the loss of a teaspoonful of blood; patient expressed herself greatly relieved, and passed a good night. Died eight hours after delivery.

Post-mortem.—Uterus healthy, except near the laceration in the posterior wall, where it was completely altered and softened in its texture, owing to chronic inflammation; fœtal head of monstrous size.—*Mr. Lord*, in *Lond. Lancet*, 1828–9, vol. p. 310.

Case CXL.—After violent pain in the bowels, uterine pains suddenly ceased, and the fœtus was felt beneath the integuments. Rupture from natural effort of the womb; pulse quickened; less anxiety of face than was to be expected. Turning, over six hours afterwards; fœtus entirely in the abdomen. Died about eighteen hours after rupture.

Post-mortem.—Intestines glued with lymph, and a layer formed for isolating the fœtus.—*Mr. Spilsbury. Lond. Lancet*, 1834–5, vol. i. p. 125.

Case CXLI.—Strong and healthy; æt. 32; tenth pregnancy; sacrum very prominent. After being five hours in regular active labour, pains suddenly ceased for twelve hours. Midwife gave ergot, and in a few hours pains returned, and the woman suddenly exclaimed that something had burst; hernia of the bowels; fœtus "too high up" to be delivered by the feet, and was brought down by the blunt hook; died in a few hours after delivery.

Post-mortem.—Uterus healthy; muscular fibre very firm; rent posterior from the fundus to the os.—*Lond. Lancet*, 1836–7, vol. i. p. 824. *Mr. Hooper.*

Case CXLII.—Æt. 30—robust; pelvis well formed; had one living child. Had been in labour four days without symptoms of rupture or peritonitis. After blood-letting, "we endeavoured to apply the forceps the whole afternoon, but without effect." Died undelivered about five days from the commencement of labor.—*Mr. Blythman. Lond. Lancet*, 1841–2, vol. i. p. 29.

Case CXLIII.—Æt. 36—robust and healthy; labours always severe and lingering, but not instrumental. After being several hours in favourable labour, pains increasing, and the head descending, during an ordinary pain, the countenance changed; felt a sense of suffocation; pulse quick and tremulous. After one hour the head had not receded, but the fœtus was felt through the parietes. On attempting to perforate, the head receded; version, over an hour after rupture; delivery "soon accomplished." Rent in anterior part. Died thirty-four hours after delivery.—*Mr. Tovey. Ibid.*, p. 321.

Case CXLIV.—Mother of eleven; pains lasted for sixteen hours, when she was delivered by a midwife, by turning of a living child. During the operation she gave a loud scream, and fatal syncope came on at once after delivery. Died in two hours.

Post-mortem.—Rent in right side through muscular coat only.—*Mr. Hancorn. Ibid.*, p. 796.

Case CXLV.—Died undelivered, after a most protracted labour, the head floating at the brim like a cork in water.—*Dr. Ingleby. Lond. Lancet*, 1839–40, vol. i. p. 631.

Case CXLVI.—Somewhat contracted brim. Died undelivered.—*Ibid.*

Case CXLVII.—Transverse presentation; child escaped into the abdomen; delivery by version. Died.—*Ibid.*

Cases CXLVIII., CXLIX.—Transverse presentations. Died.—*Ibid.*

Case CL.—Slightly contracted brim; impaction; crotchet within an hour; sloughing of the passages; died after some weeks.—*Ibid.*

Case. CLI.—Æt. 36—sixth labour; once delivered by perforation; great projection of the sacrum; pubis narrow; crista sharp; antero-posterior diameter of the brim, three and one-sixteenth inch; the lateral diameter, three and one-half inch. Sixty hours after the escape of the waters, the pains having been apparently of ordinary severity; the head not descending; craniotomy was talked of; an hour and a half after this, the pains entirely ceased; head retreated beyond reach, and the child was plainly felt in the abdomen. The uterus was well contracted; the rent was in the vagina; vomiting; pulse 130; severe suffering and tenderness; she felt the child move in the bowels at the supposed time of rupture. Four hours after rupture, exhaustion, death-like; "presently" she rallied, and gastrotomy was performed; not over half an ounce of blood lost from the integuments; but a quart or more escaped from the abdomen; was better than before the operation. Died after two days from exhaustion.

Post-mortem.—Spinal curvature. No peritonitis, except lymph in the line of incision; uterus perfectly healthy; vagina extensively torn anteriorly, and separated from the uterus by a rent of four and a half inches. Child very large.—*Ibid.* p. 637.

Case CLII.—Extensive rent in the vagina; the hand easily passed into the peritoneal cavity; was supposed nearly recovered, when on the twenty-sixth day from delivery, she suddenly died from hemorrhage.—*Dr. Collins' Treatise*, note to p. 127.

Case CLIII.—Æt. 25—first labour; waters escaped in twelve hours; pains brisk, but not violent. In nineteen hours the pains ceased; face pale and ghastly; limbs cold; constant yellow-vomiting; head very low. Perforation at once; much exertion required to deliver the head and even the shoulders. A most extensive rent posteriorly at the junction of the uterus and vagina; hernia of the intestines. Died after twenty-five days.

Post-mortem.—Rent nearly healed, but two openings into a psoas abscess on each side, of which she probably died.—*Ibid.*, p. 129.

Case CLIV.—Æt. 36—first pregnancy. Died on the fourteenth day.

Post-mortem.—Extensive peritonitis; rent at the posterior part of the vagina, at the junction of the uterus.—*Ibid.*, p. 133.

Case CLV.—Æt. 21—third child; head large and firmly ossified. Duration of labour, nine hours; pains not of unusual violence, suddenly ceased; pulse became rapid and feeble; countenance expressive of greatest distress; belly could not bear a touch; frequent vomiting; head low down; face to the pubis; delivery at once by crotchet; extensive rent of the vagina anteriorly. Died on the eleventh day.

Post-mortem.—Extensive adhesions; parts near the uterus and the inner surface of the bladder, of a dirty green (from blood). A transverse fissure in the cervix anteriorly of two and a half to three inches, filled up by partially organized lymph; no gangrene; a large quantity of clots, with some fluid blood in abdomen.—*Ibid.* p. 133.

Case CLVI.—Æt. 36—eleventh child; seven premature; after nine hours natural labour, had a sudden acute pain in the left iliac region, when the pain ceased; pulse began to sink; belly very tender; frequent vomiting: distressed countenance; head on the perinæum. Forceps at once; head could not be moved; perforation, and considerable force required; the uterus acted a little at the last. A most extensive rent at the junction of the vagina and womb; placenta among the bowels; a large quantity of fluid and clotted blood removed. Died on the tenth day.

Post-mortem—A large amount of coagula; immediate cause of death was hemorrhage; slight peritonitis.—*Ibid.*, p. 129.

Case CLVII.—Æt. 16—first child; labour of four hours; natural delivery. Died on third day.

Post-mortem.—Extensive rent in front, through the muscular substance; sinuses under the peritoneum all around the cervix, and ulcerations of the vagina from syphilis.—*Ibid.*, p. 142.

Case CLVIII.—Æt. 32—fifth pregnancy; labour of forty-eight hours, not very severe; natural delivery; death on the fifth day from violent hemorrhage.

Post-mortem.—Loss of muscular substance of the size of a shilling, opposite the sacral promontory; the peritoneum being entire.—*Ibid.*, p. 143.

Case CLIX.—Æt. 27—sixth labour; labour of one hour; natural delivery; exhaustion came on from hemorrhage. Died on the fourth day.

Post-mortem.—Rent at the junction of the uterus and vagina; muscular substance of uterus much thinned.—*Ibid.*, p. 144.

Case CLX.—Æt. 25—in labour two and a half days; pains brisk; head low; puerperal convulsions; perforation. Died seven hours after delivery.

Post-mortem.—Extensive rent in the muscular substance of the womb, and softening from syphilis.—*Ibid.*, p. 104.

Case CLXI.—Æt. 28—first labour; hydrocephalic fœtus. In labour over twenty-four hours; convulsive, sudden exhaustion; perforation; died on fifth day.

Post-mortem.—A large rent in front and lateral part of the vagina, and psoas abscess.—*Ibid.*, p. 104.

Case CLXII.—Æt. 26—second labour; firm bands obstructing the vagina; after three days' labour, convulsions set in; delivery natural.

Post-mortem.—Extensive peritonitis; rent in the vagina at its juncture with the uterus, opposite the sacral promontory, admitting two fingers; extensive effusion into the peritoneal cavity.—*Ibid.*, p. 106.

Case CLXIII.—Æt. 35—third labour; pains very strong, but no sign of danger; perforation two hours after pains ceased, and exhaustion appeared. Died on third day. Extensive rent in front at the junction of the vagina and cervix.—*Ibid.*, p. 144.

Case CLXIV.—Æt. 32—fourth pregnancy; died on second day.—*Ibid.*, p. 144.

Case CLXV.—Æt. 30—second labour; narrow outlet; labour of six hours; pains suddenly ceased; cramps; extreme tenderness; vomiting; and debility; perforation three hours afterwards; shoulders delivered with considerable difficulty. Rent in front, and to the left, between the vagina and cervix; died on the second day.—*Ibid.*, p. 144.

Case CLXVI.—Æt. 28—second child; first delivery forced; outlet narrow; labour of twelve hours; pains moderate; membranes broke; rupture soon evident; head low down; perforation extensive; rent in front, at the junction of the vagina and cervix, running into the uterus; died on second day.—*Ibid.*, p. 145.

Case CLXVII.—Æt. 30—sixth pregnancy; labour of forty-four hours; pains trifling; began to sink without any signs of rupture. Head, at the brim, out of reach of forceps; perforator used; delivery speedy. Hemorrhage reduced her much; died on the third day.

Post-mortem.—A small rent of the vagina behind, near to the cervix, opposite the sacral promontory; severe peritonitis.—*Ibid.*, p. 146.

Case CLXVIII.—Æt. 34—sixth labour; duration of labour eight hours; breech presentation; child expelled forcibly; succeeded by alarming flooding; no sign of rupture, but extreme exhaustion; died in thirty hours.

Post-mortem.—Inner coat of vagina and os torn considerably behind, and one small rent in the peritoneal coat not corresponding to the other; peritonitis.—*Ibid.*, p. 146.

Case CLXIX.—Æt. 33—third labour; contracted pelvis; force delivered before; labour of four hours; pains very feeble and ceased suddenly; sinking; version and perforation behind the ear; died in twenty-five hours.

Post-mortem.—Uterus almost torn from the vagina.—*Ibid.*, p. 147.

Case CLXX.—Æt. 28—second labour; vagina obstructed by a firm band; had been much injured by instruments in a previous labour; labour of nine hours;

very strong pains; the band was divided toward the rectum by a bistoury; rupture in four hours after; perforation. Died in twenty-four hours. Extensive opening formed between the vagina and rectum, probably in an old cicatrix.—*Ibid.*, p. 147.

Case CLXXI.—Æt. 24—second labour; pains feeble; head low; began to sink; labour lasted thirty-six hours; perforation at once; died in seventeen hours.

Post-mortem.—A rent of two inches in front, in the muscular substance; a quantity of bloody fluid in the belly; peritonitis.—*Ibid.*, p. 148.

Case CLXXII.—Æt. 30—second child; antero-posterior diameter of the brim scarce three and a half inches; force delivered before; labour of thirty-six hours; pains feeble; but the child advanced; sudden alarming debility; perforation at once; died in fourteen hours.

Post-mortem.—An opening admitting the finger at the junction of the cervix behind, and a rent of the muscular substance in front.—*Ibid.*, p. 148.

Case CLXXIII.—Æt. 30—first child; severe labour; its duration unknown; head low; perforation; died in fourteen hours.

Post-mortem.—Extensive peritonitis; rent in the muscular substance near the vagina; blood beneath the peritoneum.—*Ibid.*, p. 49.

Case CLXXIV.—Æt. 30—eleventh labour; pelvis roomy; labour brisk for five hours; pains suddenly ceased; this followed by other signs of rupture; head low; forceps tried; the head receded; version; some exertion required to remove the head; died in ten hours.—*Ibid.*, p. 149.

Case CLXXV.—Æt. 26—first labour; extreme deformity of the pelvis; antero-posterior diameter two and a half inches; labour of thirty hours; elbow presentation; wedged into the pelvis; version inadmissible; pains brisk; thorax perforated; "breech brought down with immense difficulty, requiring most laborious exertion for two and a half hours;" died in four hours.

Post-mortem.—A considerable rent at the junction of the cervix and vagina.—*Ibid.*, p. 149.

Case CLXXVI.—Æt. 35—first labour; child and secundines in the abdomen; twelve hours after rupture, version; died in sixteen hours from rupture.—*Ibid.*

Case CLXXVII.—Æt. 27—third labour; pelvis considerably under size; active labour of five hours; head low down; perforation; died in four hours; rent posteriorly, "at the usual place."—*Ibid.*, p. 150.

Case CLXXVIII.—Æt. 26—fifth pregnancy; os partly dilated; most profuse hemorrhage, for which delivered by version; died in two hours.

Post-mortem.—A rent through the os, probably caused by version though by no means forced.—*Ibid.*, p. 64.

Case CLXXIX.—Æt. 30—fifth child; twenty-four hours in labour; pains from slow became more forcible; had cramps for some time before in the right side; pains suddenly ceased; prostration; forceps failed; perforation; extensive rent in the muscular substance in front, at the junction of the cervix and vagina; died almost before delivery finished.—*Ibid.*, p. 150.

Case CLXXX.—Æt. 40—fourth pregnancy; delivered by version for profuse hemorrhage; a rent found at the cervix in front, and to the right; died soon.—*Ibid.*, p. 55.

Case CLXXXI.—Æt. 36—ninth labour; shoulder presentation; had hemorrhage for five or six hours; version; much loss of blood; death soon; rupture of two inches in front through the muscular part.—*Ibid.*, p. 46.

Case CLXXXII.—Æt. 37—sixth labour; pains at no time strong; head advancing slowly; sudden cessation of pain; extreme debility, &c.; labour of forty hours; perforation at once; died almost instantly.

Post-mortem.—A rent of the muscular substance in the "usual place;" cervix not thicker than strong brown paper.—*Ibid.*, p. 151.

Case CLXXXIII.—Mother of three; injured in the abdomen by her husband, six weeks before labour, and not well since; pains severe; suddenly ceased; rupture suspected about twenty hours after, when the uterus was firmly

contracted, and the fœtus in the abdomen, out of reach; allowed to remain undelivered as affording the best chance; died thirty-six hours after rupture.

Post-mortem.—Uterus seemed perfectly healthy; rupture from cervix to fundus. —*Dr. Blicke. Ryan's Journ.*, vol. ix. p. 123.

Case CLXXXIV.—Æt. 35—had four living; rupture occurred while drawing at a well; os found dilated; feeble pains came on; head descended; delivered by the forceps of a very large male child about six hours after the accident. Apparent transverse rupture of the muscular substance at the neck; died in twenty hours.—*Dr. Adams. Lond. and Edin. Month.*, 1844.

Case CLXXXV.—Æt. 30—had several children; had been in labour several days; os the size of a dollar; pains at first strong, growing weaker; died undelivered.

Post-mortem.—An immense flow of blood; rent from cervix to fundus posteriorly, where the tissues were not thicker than pasteboard; at other parts three and a quarter or four inches thick.—*Med. Chir. Rev.*, vol. xxv. *Dr. Wombert.*

Case CLXXXVI.—Æt. 38—mother of four dead children. In a previous labour the uterus was perceived to be thickened, and apparently diseased. Pains very strong; os fully dilated; natural presentation; promising case; pains suddenly ceased, with a rumbling in the belly. Rupture after six hours' labour; fœtus receded *immediately* after; the os tincæ was firmly contracted, with a margin of placenta presenting. Died in forty-two hours after rupture, undelivered.

Post-mortem—Rent in right side, which was much thinned; the left thickened: the whole uterus diseased.—*Ryan's Journ.*, vol. ix. p. 288, from *N. Amer. Archives of Med. and Surg. Sci. Dr. Duncan.*

Case CLXXXVII.—Æt. 25—stout; mother of three dead children; two footlings. Rupture five hours from the beginning of labour; os fully dilated; pains powerful, quick and expulsive; pains ceased; suffering in the right side; vomiting and depression; forceps tried and then the perforator. Died twenty-nine hours after rupture.

Post-mortem.—Uterus rather flabby, and universally of a pinkish red, not removed by sponging. A longitudinal rent to the right, behind. At the seat of laceration the tissues soft and easily torn.—*Guy's Hosp. Reps.*, vol. vi. p. 72.

Case CLXXXVIII.—Strong; borne three living children; labours lingering and very painful; linea ileo pectinea exceedingly sharp; pains extremely severe; rupture after labour of ten and a half hours. Complained of a sense of cracking and a cramp; pains suddenly ceased; great prostration; fœtus passed into the abdomen; perforation at once; delivered after some difficulty, the uterus assisting; bones of the cranium highly ossified; died fifteen hours after rupture.—*Ibid.*, p. 73.

Case CLXXXIX.—Æt. 36—had six living children; labours difficult, the fifth instrumental; small pelvis; pains severe and constant; head slightly descended. Twenty-four hours after the beginning of labour, was seized by an attendant and violently jolted up and down during a pain, to facilitate the labour; immediately afterwards pain declined; vomiting and depression. Perforation after six or eight hours; placenta in the abdomen, and its removal difficult. Died about forty hours after rupture. Womb rent through three-fourths of the posterior part and cervix.—*Ibid.*, p. 78.

Case CXC.—Æt. 25—had two still-born, labours instrumental; pelvis small. Pains strong; about twenty-seven hours from the first, had a sense of suffocation; pulse rose; pains gradually ceased; some hemorrhage; head did not recede; died about eight weeks.

Post-mortem.—Rent in posterior part of the cervix and vagina not healed.—*Mr. Birch, Med.-Chir. Trans.*, vol. xiii. p. 358.

Case CXCI.—Mother of eleven; had a blow on the belly; went her full time; labour tedious; restless for twenty-four hours. After rest, procured by opium, strong pains came; delivery soon expected; pains suddenly ceased, and she said the child had slipped into the belly. Died in a few minutes, undelivered. —*Bard's Midwifery*, from *Med. and Phys. Journ.*, vol. xiii. p. 234.

Case CXCII.—Second labour; first delivery by perforation; contracted pelvis; premature labour induced; pains active; case favourable; rupture sudden

perforation in about an hour after. Died in about two hours. Rent transverse, opposite the sacrum.—*Ramsbotham's Pract. Observ., Case LXXVII.*

Case CXCIII.—Æt. 30—seventh labour; good pelvis; pains strong and short; os the size of a crown-piece; pains abated, then ceased. Died in a few hours, undelivered.

Post-mortem.—Rent from cervix to fundus on the right side; child escaped excepting the head; fœtus hydrocephalic.—*Ibid., Case LXXVIII.*

Case CXCIV.—Stout; fourth labour; previous labours tedious; duration of labour about twelve hours; labour slow; pains suddenly ceased; prostration, &c. Vectis and the forceps had been tried; head impacted, and delivered with great difficulty in two to three hours after rupture. Died in about thirty-six hours.—*Ibid., Case LXXIX.*

Case CXCV.—Had several living; labour of nine hours' duration, more or less; very favourable; os dilating; sudden spasm-like pain; vomiting and depression; pains gradually ceased; head receded; beyond reach of the finger; turning easy. Died in about seventy-two hours—*Ibid., Case LXXX.*

Case CXCVI.—Æt. 40—seventh child; all the former still-born; deformed pelvis; head perforated when the os equalled a half-crown; one hour after this, rupture took place. Died soon.

Post-mortem.—Transverse rent above the pubes, through the muscular coat and through the peritoneum at one point.—*Ibid., Case LXXXI.*

Case CXCVII.—Second child; antero-posterior diameter of the brim two and a half inches; common labour; perforation about to be made when rupture suddenly took place; cramps in the belly; head receded; turning and perforation behind the ear at once. Died in about twenty-four hours.

Post-mortem.—A large rent opposite the sacral promontory, which was a sharp ridge.—*Ibid., Case LXXXII.*

Case CXCVIII.—Shoulder presentation; rupture had taken place before delivery by version. Died in a few hours.—*Ibid., Case LXXXIII.*

Case CXCIX.—Seventh labour; tedious; no alarming symptoms during labour, but gradually sank (undelivered?) in about twelve hours.

Post-mortem.—Rent of several inches in the peritoneal coat of the back and side; the fleshy portion not implicated—*Ibid., Case LXXXVI.*

Case CC.—Æt. 30—second child; deformed pelvis; labour going on well; head descending; sudden, severe pain in the belly; pains ceased; great prostration; perforation; delivered not without some difficulty; died about forty-eight hours after; duration of labour about forty-eight hours.

Post-mortem.—Rent in the posterior part of the vagina, not involving the cervix. *Ibid., Case LXXXVII.*

Case CCI.—Æt. 35—had several children; pains pretty frequent and severe; after an increase of these attended by severe pain; head well descended; uterus ceased acting and collapse after about twelve hours' labour. Died two hours after.

Post-mortem.—A large quantity of blood in the abdomen; rent at the junction of the body and cervix; around the rent it was thin, tender and very dark. *Dr. Coffin, New. Eng. Journ.*, vol. iii. p. 114.

Case CCII.—Very large and plethoric; labour tedious, and suffering disproportionate to the uterine action; sudden rupture seven hours after escape of the waters; head receded. Died in two and a half days, undelivered.

Post-mortem.—Uterus very firm and two inches thick; a longitudinal rent admitting three fingers. *Ibid.*, p. 115.

Case. CCIII.—Æt. 35—good health; borne several; at full time fell upon the ice and struck her abdomen, causing her to feel that she was split open; repeated syncopes; incessant vomiting; cold surface; death-like aspect during twenty-four hours; os undilated; occasional pain and extreme tenderness of belly; seventy-two hours after rupture, symptoms no better; os still undilated; artificial dilatation commenced, a "process so obstinately resisted by the unyielding state of the parts as to require from four to five hours to effect a delivery of the child." Child large; profuse hemorrhage, from the uterus not contracting; firm adhesion in part, of the placenta to the uterus. Died on the sixth day from rupture.

contracted, and the fœtus in the abdomen, out of reach; allowed to remain undelivered as affording the best chance; died thirty-six hours after rupture.

Post-mortem.—Uterus seemed perfectly healthy; rupture from cervix to fundus. —*Dr. Blicke. Ryan's Journ.*, vol. ix. p. 123.

Case CLXXXIV.—Æt. 35—had four living; rupture occurred while drawing at a well; os found dilated; feeble pains came on; head descended; delivered by the forceps of a very large male child about six hours after the accident. Apparent transverse rupture of the muscular substance at the neck; died in twenty hours.—*Dr. Adams. Lond. and Edin. Month.*, 1844.

Case CLXXXV.—Æt. 30—had several children; had been in labour several days; os the size of a dollar; pains at first strong, growing weaker; died undelivered.

Post-mortem.—An immense flow of blood; rent from cervix to fundus posteriorly, where the tissues were not thicker than pasteboard; at other parts three and a quarter or four inches thick.—*Med. Chir. Rev.*, vol. xxv. *Dr. Wombert.*

Case CLXXXVI.—Æt. 38—mother of four dead children. In a previous labour the uterus was perceived to be thickened, and apparently diseased. Pains very strong; os fully dilated; natural presentation; promising case; pains suddenly ceased, with a rumbling in the belly. Rupture after six hours' labour; fœtus receded *immediately* after; the os tincæ was firmly contracted, with a margin of placenta presenting. Died in forty-two hours after rupture, undelivered.

Post-mortem—Rent in right side, which was much thinned; the left thickened: the whole uterus diseased.—*Ryan's Journ.*, vol. ix. p. 288, from *N. Amer. Archives of Med. and Surg. Sci. Dr. Duncan.*

Case CLXXXVII.—Æt. 25—stout; mother of three dead children; two footlings. Rupture five hours from the beginning of labour; os fully dilated; pains powerful, quick and expulsive; pains ceased; suffering in the right side; vomiting and depression; forceps tried and then the perforator. Died twenty-nine hours after rupture.

Post-mortem.—Uterus rather flabby, and universally of a pinkish red, not removed by sponging. A longitudinal rent to the right, behind. At the seat of laceration the tissues soft and easily torn.—*Guy's Hosp. Reps.*, vol. vi. p. 72.

Case CLXXXVIII.—Strong; borne three living children; labours lingering and very painful; linea ileo pectinea exceedingly sharp; pains extremely severe; rupture after labour of ten and a half hours. Complained of a sense of cracking and a cramp; pains suddenly ceased; great prostration; fœtus passed into the abdomen; perforation at once; delivered after some difficulty, the uterus assisting; bones of the cranium highly ossified; died fifteen hours after rupture.—*Ibid.*, p. 73.

Case CLXXXIX.—Æt. 36—had six living children; labours difficult, the fifth instrumental; small pelvis; pains severe and constant; head slightly descended. Twenty-four hours after the beginning of labour, was seized by an attendant and violently jolted up and down during a pain, to facilitate the labour; immediately afterwards pain declined; vomiting and depression. Perforation after six or eight hours; placenta in the abdomen, and its removal difficult. Died about forty hours after rupture. Womb rent through three-fourths of the posterior part and cervix.—*Ibid.*, p. 78.

Case CXC.—Æt. 25—had two still-born, labours instrumental; pelvis small. Pains strong; about twenty-seven hours from the first, had a sense of suffocation; pulse rose; pains gradually ceased; some hemorrhage; head did not recede; died about eight weeks.

Post-mortem.—Rent in posterior part of the cervix and vagina not healed.—*Mr. Birch, Med.-Chir. Trans.*, vol. xiii. p. 358.

Case CXCI.—Mother of eleven; had a blow on the belly; went her full time; labour tedious; restless for twenty-four hours. After rest, procured by opium, strong pains came; delivery soon expected; pains suddenly ceased, and she said the child had slipped into the belly. Died in a few minutes, undelivered. —*Bard's Midwifery*, from *Med. and Phys. Journ.*, vol. xiii. p. 234.

Case CXCII.—Second labour; first delivery by perforation; contracted pelvis; premature labour induced; pains active; case favourable; rupture sudden

perforation in about an hour after. Died in about two hours. Rent transverse, opposite the sacrum.—*Ramsbotham's Pract. Observ., Case LXXVII.*

Case CXCIII.—Æt. 30—seventh labour; good pelvis; pains strong and short; os the size of a crown-piece; pains abated, then ceased. Died in a few hours, undelivered.

Post-mortem.—Rent from cervix to fundus on the right side; child escaped excepting the head; fœtus hydrocephalic.—*Ibid., Case LXXVIII.*

Case CXCIV.—Stout; fourth labour; previous labours tedious; duration of labour about twelve hours; labour slow; pains suddenly ceased; prostration, &c. Vectis and the forceps had been tried; head impacted, and delivered with great difficulty in two to three hours after rupture. Died in about thirty-six hours.—*Ibid., Case LXXIX.*

Case CXCV.—Had several living; labour of nine hours' duration, more or less; very favourable; os dilating; sudden spasm-like pain; vomiting and depression; pains gradually ceased; head receded; beyond reach of the finger; turning easy. Died in about seventy-two hours—*Ibid., Case LXXX.*

Case CXCVI.—Æt. 40—seventh child; all the former still-born; deformed pelvis; head perforated when the os equalled a half-crown; one hour after this, rupture took place. Died soon.

Post-mortem.—Transverse rent above the pubes, through the muscular coat and through the peritoneum at one point.—*Ibid., Case LXXXI.*

Case CXCVII.—Second child; antero-posterior diameter of the brim two and a half inches; common labour; perforation about to be made when rupture suddenly took place; cramps in the belly; head receded; turning and perforation behind the ear at once. Died in about twenty-four hours.

Post-mortem.—A large rent opposite the sacral promontory, which was a sharp ridge.—*Ibid., Case LXXXII.*

Case CXCVIII.—Shoulder presentation; rupture had taken place before delivery by version. Died in a few hours.—*Ibid., Case LXXXIII.*

Case CXCIX.—Seventh labour; tedious; no alarming symptoms during labour, but gradually sank (undelivered?) in about twelve hours.

Post-mortem.—Rent of several inches in the peritoneal coat of the back and side; the fleshy portion not implicated—*Ibid., Case LXXXVI.*

Case CC.—Æt. 30—second child; deformed pelvis; labour going on well; head descending; sudden, severe pain in the belly; pains ceased; great prostration; perforation; delivered not without some difficulty; died about forty-eight hours after; duration of labour about forty-eight hours.

Post-mortem.—Rent in the posterior part of the vagina, not involving the cervix. *Ibid., Case LXXXVII.*

Case CCI.—Æt. 35—had several children; pains pretty frequent and severe; after an increase of these attended by severe pain; head well descended; uterus ceased acting and collapse after about twelve hours' labour. Died two hours after.

Post-mortem.—A large quantity of blood in the abdomen; rent at the junction of the body and cervix; around the rent it was thin, tender and very dark. *Dr. Coffin, New. Eng. Journ.*, vol. iii. p. 114.

Case CCII.—Very large and plethoric; labour tedious, and suffering disproportionate to the uterine action; sudden rupture seven hours after escape of the waters; head receded. Died in two and a half days, undelivered.

Post-mortem.—Uterus very firm and two inches thick; a longitudinal rent admitting three fingers. *Ibid.*, p. 115.

Case. CCIII.—Æt. 35—good health; borne several; at full time fell upon the ice and struck her abdomen, causing her to feel that she was split open; repeated syncopes; incessant vomiting; cold surface; death-like aspect during twenty-four hours; os undilated; occasional pain and extreme tenderness of belly; seventy-two hours after rupture, symptoms no better; os still undilated; artificial dilatation commenced, a "process so obstinately resisted by the unyielding state of the parts as to require from four to five hours to effect a delivery of the child." Child large; profuse hemorrhage, from the uterus not contracting; firm adhesion in part, of the placenta to the uterus. Died on the sixth day from rupture.

Post-mortem.—Gangrenous patches on the walls of the abdomen; fetid gas escaped; a full sized fœtus among the bowels; rent in the superior part in front; very little blood "in the cavities," but a quantity of serous fluid.—*Dr. Hyde. Bost. Med. and Surg. Journ., Jan.* 1842, p. 377.

Case CCIV.—At full term, considerable pain in the belly; after some convulsive movements, fœtus assumed a transverse position in the lower part of the abdomen, and ceased to move. Some days afterward, new pains, and the placenta was extracted; afterward, occasional hemorrhages; the blood becoming putrid; fever and alarming symptoms. Died forty-eight days after rupture.

Post-mortem.—Womb torn in front; fœtus among the intestines; uterus, &c., putrilaginous.—*Dict. des Sci. Med.*, vol. xlix. p. 241, from "*Mélanges de Chirurg.*, tom. ii. p. 295. *M. Saucerotte.*"

Case CCV.—Sixth pregnancy; was awakened from sleep by a cramp in the abdomen; severe pains with vomiting; waters escaped; womb acted violently; os dilating; arm presentation; apparently without warming the fœtus escaped into the abdomen; delivered soon but no relief followed; symptoms of strangulated hernia succeeded; died in twenty-two or twenty-four hours from the first pains.

Post-mortem.—All the viscera gangrenous, and strangulation of the bowels in the rent; rent in the posterior and lateral superior part.—*Ibid.*, p. 243, from *M. Percy in Observs. Acad. de Chirurg.* 1783.

Case CCVI.—Æt. 36—fifth child; labours long and severe; the first followed by chronic cystitis, but for years she had been free from disease. Labour regular from the first and everything was well. After seventeen hours' labour, the waters escaped, after which she had four pains and they then ceased. Child could be felt in the abdomen; rupture suspected, but there were *no symptoms, no pain or sinking or motion of the child.* Ergot was given and in about five hours, pulse rather weak and sinking; an attempt was made with forceps, then with the lever. The child suddenly escaped into the abdomen; profuse hemorrhage and syncope when the hand was introduced. Died about twenty-one hours after rupture.

Post-mortem.—Extensive rent from the fundus to the bladder; parietes of the uterus thin as paper; and at the insertion of the Fallopian tubes was transparent and frail as cobweb; bladder scirrhous and in parts two and a half inches thick. Pressure of this scirrhous mass probably caused the thinning.—*Phil. Med. and Phys. Journ.*, vol. iii. p. 422.

Case CCVII.—Æt. 34—delivered in the first by forceps; in the second by version: antero-posterior diameter of the brim not over three inches. Os dilated; waters escaped; pains strong; no descent; prolapsus funis. After five hours labour, version attempted; the head was arrested; forceps applied; these failing, perforation; great difficulty experienced in turning and delivery. Metritis followed. Died on the twenty-eighth day.

Post-mortem.—Rent of the whole of the right side of the neck.—*Desormeaux. Archives Gén.*, vol. ii. 1823, p. 77.

Case CCVIII.—Æt. 30—first labour; good pelvis; very rigid os. On escape of the waters, after several hours of severe labour, blood escaped, and death followed soon from hemorrhage.

Post-mortem.—A longitudinal rent at the posterior and lateral part; the child in the abdomen, and much blood. Walls at the place of rupture evidently thinned; the neck remarkably thick and hard, almost scirrhous.—*M. Guibert. Arch. Gén.* vol. ix. 1825, p. 390.

Case CCIX.—Æt. 34—fifth pregnancy; had great anteversion of the womb, so that it hung over the thighs. When in labour five hours, just as the finger reached the fundus of the vagina, cried out she was killed, and fainted at once; pains ceased; waters at the same time escaped with blood; child escaped into the peritoneal cavity; feet felt, seized and dragged through the rent; child born asphyxiated, was recovered but died soon. Died.

Post-mortem.—The whole posterior part torn from the vagina; a semicircle of four or five inches, the edges of the rent rough.—*M. Moulin. Arch. Gén*, 1825, p. 391.

Case CCX.—Well formed; borne several. At the seventh month, after a walk,

had hemorrhage and was very weak and ailing for two months. At full time pains came on but soon went off; os undilated. After several days a fœtid discharge with bones of part of the fœtus escaped by the vagina; this continued and for several months she had a prospect of recovery. Motion of a carriage during a ride induced inflammation, which soon proved fatal.

Post-mortem.—A small rent of the cervix in front through which the *debris* of the fœtus had escaped; remainder of the fœtus in a membranous sac disconnected from the abdomen.—*Dr. Sims. Med. Facts*, vol. viii. p. 150.

Case CCXI.—Thirteenth labour; had an enormous tumour of the spleen extending near to the pubes. Suffered a good deal in pregnancy; especially in the latter days; pains very strong; three days after escape of the waters felt a cracking in the womb, and began to bleed; duration of labour five days; died undelivered.

Post-mortem.—Fundus completely torn through; the enormous spleen compressed the womb.—*Ibid.*, vol. xxxvii. p. 262, from "*Il Filiatro Sebezio*, 1825."

Case CCXII.—Pains moderate and regular; after gradually declining for some time, ceased. Three and a half hours after this her face was pale, rather anxious; pulse 160, small; belly very tender; head low under the pubis. Forceps applied but the head could not be moved, even with a third blade; the limbs at this time felt in the abdomen; turning now resorted to, and the mother died during delivery; rupture on the left side.—*Dr. Griscom. New York Journ. Med. &c.*, 1844, vol. ii. p. 333.

Case CCXIII.—Æt. 28—third child; os dilated; pains during two hours became intense; no descent of the head. About nine hours from the first of labour, pains suddenly ceased and a colicky pain remained. Nothing but this to indicate rupture, and nineteen hours afterward, ergot was given without effect; four hours afterward, dark vomiting and tenderness of the belly; turning about twenty-five hours from probable time of rupture: done with considerable difficulty; hemorrhage to about six ounces; hernia of the bowels; died three hours after delivery.

Post-mortem.—A pint of bloody fluid; womb, contracted; a transverse rent in front half across the os and a short one of the os; two small exostoses of the pubes. —*Dr. Wagstaff. Ibid.*, p. 381.

Case CCXIV.—Tenth labour; previous labours easy. About seven and a half hours after the escape of the waters, she felt a slight acute pain in the belly and she said; "feel what a strange lump is in my side!"—the head had receded; turning soon after, with perforation behind the ear; child hydrocephalic; rent through the whole extent of the left side; died in twenty-three hours.—*Dr. Fahnestock. Ibid.*, p. 383.

Case CCXV.—Contracted brim from prominence of the sacrum. Labour remarkable for violent pains, the suffering having been excessive for six hours, the pains ceased; collapse ensued; membranes were broken, and os dilated; rupture twelve hours after commencement of labour; forceps applied but failed; perforation; died on the third day.

Post-mortem—Rent to the left and behind.—*Mr. Roberton*, in *Edin. Med. and Surg. Journ.*, July, 1834.

Case CCXVI.—Æt. 30—delicate; second labour; the first difficult; the antero-posterior diameter of the brim diminished by projection of the sacrum. After thirteen hours had a sharp pain in the lower part of the belly, followed by vomiting and syncope; head on the perinæum; condition hopeless; considerable flooding; craniotomy.

Post-mortem—Rent in the vagina behind, into the body of the uterus.—*Ibid.*

Case CCXVII.—Æt. 37—eleventh labour; brim narrow, from exostosis of the pubis; labour very long; prolapsus funis; os dilated; head filling the hollow of the pelvis. After twelve hours of labour, died suddenly without appreciable cause, undelivered.

Post-mortem.—In the left and front a rent of two inches in an ecchymosed part; foot of the fœtus, enveloped in the bag of membranes, thrust through it; several pounds of blood lost.—*Ibid.*

Case CCXVIII.—Æt. 28—sixth labour; four still-born; one a forceps case; brim

narrowed by prominence of the sacrum; labour but little painful; at the end of six hours, all at once a sharp pain came on; immediate hemorrrhage, and collapse directly followed. On attempting to perforate, the head retreated; version; head delivered with much difficulty; died on the second day.

Post-mortem.—Rent from cervix to fundus.—*Ibid.*

Case CCXIX.—Æt. 44—fifth labour; four first very difficult, but not instrumental; sacrum prominent, and exostosis of pubis. After seventeen hours, labour pains became very violent; in two hours, excessively painful cramps in the belly, then vomiting and cessation of pains forthwith. Two hours afterward, version; the fœtus almost entirely out of the womb; head extracted with much difficulty. Died on the third day.

Post-mortem.—A transverse rent of the neck, involving the bladder.—*Ibid.*

Case CCXX.—Æt. 29—narrow pelvis; rupture after a labour of ten hours; rent to the right in front. Delivered between two and three hours after rupture. Termination unknown.—*Ibid.*

Case CCXXI.—Æt. 26—stout and healthy; fourth labour; former labours severe and protracted; slightly contracted pelvis. After severe suffering for several hours, the head being unusually large, and considerably advanced in the pelvis, during a severe pain had a sense of something giving way; the head receded; hemorrhage followed; faint and restless; nausea, but no vomiting; pale, and had distress in the belly. One hour afterward, no presentation to be felt; state alarming; pulse rapid and feeble; great restlessness and anxiety. Gastrotomy, occupied but a few minutes; felt much relieved; suffered less than in former labours, and began to rally; the membranous bag was found unbroken; considerable blood among the intestines; female child of eleven pounds. Patient improved until the eighth day, when she gradually sank.

Post-mortem.—A dark brown ragged opening, chiefly in the posterior wall of the vagina, and extending through a small portion of the cervix; also a considerable transverse rent at junction of cervix and vagina: edges of the rent irregular, dark brown, but free from gangrene.—*Prov. Med. Journ.*, 1845, p. 549. *William Jackson.*

Case CCXXII.—Æt. 20—primipara; good health. After eight hours' labour, os nearly dilated; waters escaped; doing well; her attendant gave a dose of ergot; pains were increased; head receded; she was found exhausted, and a shoulder presented; version. Died in a few days.—*Ibid.*, 1842, p. 278, from *Journ. Pract. Med. de Montpelier. M. Delmas.*

Case CCXXIII.—A negress, æt. 35—mother of several; always suffered before and after labour. Suddenly seized with uterine pains, which went off suddenly, and were followed by fainting, hemorrhage, and nausea; os admitted the little finger; was bled, and ergot given; os dilated by force about fourteen hours after; turning. Died in about seventeen hours from rupture.

Post-mortem.—Extensive rent posteriorly; uterus unusually soft; traces of inflammation of mucous surface at different periods; peritoneum had "erysipelatous discolouration."—*Ibid.*, 1844, p. 250. *Dr. Arnold, of Jamaica.*

Case CCXXIV.—Æt. 30—seventh labour; had griping pains in the abdomen for several days. Pains during the first eight hours, irregular and spasmodic; small doses of ergot given; os well dilated; ergot again. After eleven hours of labour, had violent cutting pain, most excruciating, with a loud report which awakened the doctor. Great bearing down pains for a few moments, followed by a cessation of pain for several hours. Delivered after several hours, by repeated application of the forceps. Died in thirty hours.

Post-mortem.—Rent posteriorly; with hernia of the bowels.—*Dr. Gill, Ibid.*, 1841, p. 208.

Case CCXXV.—Æt. 38—very fat; had seven children, and two abortions; labours always severe and slow; abdomen pendulous; os dilated; pains powerful but "abdominal;" head low. About nine hours after rupture of the membranes, had a very severe pain, and the uterus ceased acting for three hours, when symptoms of great prostration came on, and a rent could be felt. About three hours from rupture, version; the head assisted by the blunt hook; the child and secundines

in the abdomen, with hernia of the bowels. Delivery effected with great difficulty. Died in about three and a half days.

Post-mortem.—Upper part of the vagina at the junction with the uterus, lacerated posteriorly for one-half its circumference.—*Mr. Elkington. Ib.*, 1844, p. 372.

Case CCXXVI.—Second pregnancy; pains severe after rupture of the membranes. After twelve hours' labour, green vomiting came on, followed in a few hours by convulsions; forceps failed; version effected with difficulty. Death.

Post-mortem.—A rent of uterus and vagina admitting the fist; hernia of the bowels.—*Lond. Med. Repos.*, vols. xii. and xiii. p. 159, from *Bullet. Med.*, 1819.

Case CCXXVII.—Æt. 26—fourth labour; antero-posterior diameter of the brim three inches; never required artificial aid. During forty-eight hours had slight grinding pains, which went off; during the next twelve hours pains strong and frequent; os dilated. In two to three hours more, bilious vomiting; pulse quick; this was preceded by a sound of a snap, a remission of the pains, and an exclamation that all was over! Between four and five hours after this, version and perforation behind the ear; it was easily accomplished, the fœtus being small. Died between five and six days from rupture.

Post-mortem.—A rent of four to five inches in the right side; hernia of the bowels: edges of the rent and inner surface gangrenous.—*Mr. Holmstead. Ibid.*, vol. xxii. p. 209.

Case CCXXVIII.—An unusually prominent sacrum; pains very slight, and subsided entirely after the escape of the waters; the os dilated; presentation natural. There had been no vomiting, scream, or other sign of rupture, and ten hours after the cessation of pain she was only a little restless, and respiration a little hurried. Ergot given without any effect. Death.

Post-mortem.—A rent in front, in the direction of the linea ileo pectinea, which was not sharp, two-thirds across the uterus. It was of extraordinary thinness.—*Ibid.*, vol. xxiii. p. 520, from *Philada. Journ., No.* 17. *Dr. Broyles.*

Case CCXXIX.—Rupture of the whole parenchyma without implicating the peritoneal covering, from manual violence. Hemorrhage came on in twenty minutes; died soon from flooding.—*Davis' Obstet. Med.*, p. 751.

Case CCXXX.—Subject to uterine hydatids; waters escaped when the os was only equal to a half crown; pains gradually increased for several hours, and entirely ceased; no alarming symptoms. Six weeks after this, portions of the fœtus began to be discharged from an abscess near the navel, and from the vagina. Died after two months.

Post-mortem.—Small intestines communicated with the uterus by four apertures. *Mr. Windsor, of Manchester*, in *ibid.*, p. 756.

Case CCXXXI.—Æt. 40—first child; rickety; pelvis very narrow; after severe pains for several days, membranes unbroken, felt something tear in her abdomen. Perforation; there was no great flooding; no vomiting, nor convulsions. Died in ten or twelve hours.

Post-mortem.—Rent at the fundus admitting the hand; hernia of the bowels.—*Smellie's Cases*, vol. iii. p. 385.

Case CCXXXII.—Arm presentation; midwife endeavoured three times to turn, while the patient was struggling to prevent her, and during pains; after uninterrupted pains of twenty-four hours, the hand protruded; very soon after she became suddenly easy; ceased to cry and almost at once vomited; face cold; breathing nearly stopped. Turning; died in three hours. A circular rent of the size of a sixpence in the cervix between the fœtal shoulder and the pubis.—*Ashwell's Parturition*, p. 316.

Case CCXXXIII.—Pains feeble and at long intervals for a few hours; alarming symptoms followed upon slight hemorrhage, and the pains ceased; respiration laboured. Died

Post-mortem. Rent posterior; uterus sloughy, thin, and livid near it.—*Gooch's Midwifery*, p. 251.

Case CCXXXIV.—Fourth labour; pelvis narrow; corpulent. Pains very strong, with a tearing sensation in the back in the intervals of pain; head at the brim, but did not advance; much coffee-coloured water escaped on rupture of the mem-

branes; when in labour over eight hours, the head receded, and a "ripping" sensation in the abdomen; version; fœtus after a while delivered as far as the hips and allowed to remain. Rent posterior, half way up to the fundus.—*Edin. Pract. Med.*, vol. v. p. 490.

Case CCXXXV.—Second child; the first a forceps case. Pains for thirty hours, of unusual severity; os completely dilated; pains suddenly ceased; slight hemorrhage; immediate vomiting of dark green; excessive prostration; difficult breathing; extreme anxiety; pulse extremely rapid and feeble. In fifteen hours no part of the fœtus could be felt *per vaginam;* form of abdomen changed, and extremely tender; child's limbs distinctly felt; a coil of intestines in the womb, and a large rent in the left side; was in a better state than at the time of the accident; no pain except on pressure; fissure in the womb, so contracted as not to admit the finger. Gastrotomy nineteen hours after rupture; a large quantity of bloody fluid in the abdomen, and the placenta; intestines much inflamed; child large; not half an ounce of blood lost in the operation, and was comfortable after it. Died sixteen hours after the operation, and thirty-five after the rupture.—*Dr. Delafield. N. York Med. Journ.*, vol. vii. p. 351.

Case CCXXXVI.—Frightened the first day of labour; eight days after it began she had no pains, and was extremely low; chin presentation; version; dead child; hernia of the bowels. Died six hours after delivery.—*Smellie's Cases*, vol. iii. p. 386.

Case CCXXXVII.—After eleven or twelve hours of very long and severe pains, had a terrible movement of the fœtus and fainted. Pains ceased; the belly was hard, tender, and painful; incessant vomiting, &c.; head at the brim; version after twelve hours, with little difficulty; the child's limbs among the intestines. Rent in the fundus. Died in three days.—*La Motte* (1726), p. 463.

Case CCXXXVIII.—Tenth pregnancy; strong and hearty; pains lively and frequent; waters escaped; arm presentation. Pains severe for only one and a half or two hours, then gradually became feeble until six hours from the first of labour. child in the abdominal cavity; version, without difficulty. Died in four days.

Post-mortem.—The rent admitted the tip of the little finger.—*Ibid*, p. 464.

Case CCXXXIX.—Primipara; after three days of labour, patient and midwife both heard something burst within her; her abdomen was of an altered form; the head impacted. Died while the doctor was gone for his instruments.

Post-mortem.—Uterus tympanitic and emphysematous on the left side where the peritoneum was separated. Substance of the womb one-eighth of an inch thick and tore like writing paper; rent posterior, from the os towards the left.—*Med. Rev. and Mag.*, vol. i., "from *Duncan's Annals*, 1798."

Case CCXL.—Ninth child; twins twice; all natural. Pains had been very strong and ceased; had anxiety, pain in the belly, &c. Delivered; mode not stated. Died three minutes after delivery; hernia of the bowels; rent anterior from the os upwards.—*Ibid.*

Case CCXLI.—Æt. 38—first labor; progress tedious; head impacted; delivery natural. Died on third day.

Post-mortem.—Rent of two and a half inches in the right side from the fundus to the cervix; no mark of gangrene.—*Ibid*, vol iii., from *Med. Facts and Observs.*, vol. viii.

Case CCXLII.—Æt. 36—fourth labour; arm presentation; after "utmost efforts at delivery," died undelivered. Duration thirteen hours.

Post-mortem.—Rent in the left side; extremity of rent black, thin and putrid; the inferior part preternaturally thickened to equal three fingers; remainder healthy.—*Heister's Observs.*, No. 516.

Case CCXLIII.—Had borne several; labour not far advanced; vomiting came on; became pulseless; clammy perspiration; cold extremities; child felt through the parietes of the abdomen. Died in about three hours undelivered.—*Dr. Bedford's Notes to his Translat. of Chailly*, p. 268.

Case CCXLIV.—Had borne several; head descending; somewhere about three hours from the beginning of labour, a snap was heard; immediate vomiting and collapse; very soon delivered by forceps. Died in about ten hours.—*Ibid.*

Case CCXLV.—Was in labour eighteen hours; ergot had been given, and version attempted afterwards. Died undelivered, in about two hours after the presumed rupture.

Post-mortem.—A rent of six inches in the left lateral wall.—*Ibid.*, p. 228.

Case CCXLVI.—Delivery by natural effort; placenta retained by spasmodic contraction; died.—*Burns's, op.*, p. 5, 475.

Case CCXLVII.—Head resting on the perineum and head receded. Delivered; mode not stated. Died.—*Ibid.*, from *Douglas' Essay*, p. 50.

Case CCXLVIII.—Second child; the first a craniotomy case; short diameter of the brim two and three-fourths inches. Artificial premature delivery at the eighth month; rupture three and a half hours after the membranes broke; turning very soon. Died on fourth day.

Post-mortem.—*Linea ileo pectinea* very sharp, and sharp juttings from the pubis into the cavity.—*Ramsbotham, Process of Parturit.*, p. 417.

Case CCXLIX.—The head at the brim escaped into the abdomen, whilst the breech was forced into the pelvic cavity. Breech brought down and extracted with some difficulty. Rent at the cervix into the vagina.—*Ibid.*, p. 419.

Case CCL.—Æt. 28—well formed, but small; sixth child; pains mild at first, became severe. About six hours from the first of labour she was pale; restless; averse to move; irritable and desponding; pains trifling and unfrequent; she had flooded; the os a little dilated; membranes tense; presentation natural; membranes artificially ruptured; in a few pains the head descended into the pelvis. After a time ergot given; energetic pains induced; child's head born; and after a cessation of pains for fifteen minutes, the body and placenta expelled. Died in six hours.

Post-mortem.—Uterus firmly contracted; rupture posterior near the fundus; of the size of a crown-piece; its margin irregular, surrounded by a reddened stain; near it three or four small cracks. The rupture extended only two-thirds through the muscular substance; womb seemed sound elsewhere.—*Mr. Chatto, Lond. Med. Gaz.*, vol. x. p. 630.

Case CCLI.—Mother of several; for two hours from rupture of the membranes, labour favourable, and a prospect of speedy delivery. On sitting up and making some exertion, had a sudden pain and fainting, with agitation, and said "the child had gone back again;" head receded at once; anxiety; quick respiration; restlessness, thirst, vomiting; entire cessation of pains; slight hemorrhage; rupture evidently not suspected for twenty-one hours; then the limbs felt; the child being in the abdomen, and putrid; version difficult, but the uterus uncontracted; hernia of the bowels after delivery. Died immediately.

Post-mortem.—Belly distended with gas; three pints of blood and water removed; a rent of the whole length of the womb posteriorly; this part had the livid appearance of gangrene; the rest natural.—*Dr. James, in Am. Med. Repos.*, vol. vii. p. 328.

Case CCLII. (Case CXIII. *continued.*)—In her fourth labour Cæsarean section, on account of supposed contraction of the pelvis. After this delivered of twins at full time alive, by another practitioner. In her sixth labour the uterus acted with great energy, and she exclaimed that something had given way; considerable hemorrhage followed; vomiting and syncope; head receded; gastrotomy; child almost all in the cavity of the peritoneum; dead. Lived thirty-six hours.

Post-mortem.—Rupture at the place of previous incisions.

Case CCLIII.—Æt. 32—third labour; pains feeble and few at first; rupture of membranes accompanied by slight hemorrhage; regular pains ceased, and an irregular pain took their place. Ergot was given; the os dilated; the head presented; forceps could have been applied, but it being many hours after rupture before she was seen, it was considered too late. Died soon after admission.

Post-mortem.—Extensive rent in the right side through the muscular substance only, from the cervix to the round ligament.—*M. Dubois*, in *Journ. de Méd. et Chirurg.*, July 1846, p. 293.

Case CCLIV.—Æt. 28—small and always sickly; very bad health during pregnancy; mother of three. Fell with force, and at the time felt a sense of tear-

ing and giving way inside; slight vaginal hemorrhage; was restless; had an indescribable oppression in the abdomen for three days, but no pain; kept about the house. Strong pains came on, followed after some hours by exhaustion; the fœtus was in the peritoneal cavity; version. Death five hours after delivery.

Post-mortem.—All the abdominal viscera intensely inflamed, except the uterus; right side of the uterus "dark-looking, relaxed, thin as a sixpence in some places, and transparent." A fissure three and a half inches in extent, with ragged sloughy edges running perpendicularly to the cervix; the remainder of the womb healthy.—*Mr. Spark, Lond. Med. Gaz.*, vol. iii. p. 218.

Case CCLV.—Æt. 28—fifth labour; after a sudden movement of the fœtus had a pain and a sense of faintness; rallied; os somewhat dilated. Eleven hours afterwards fluid detected in the abdomen; delivered by artificial means, and died twenty-two hours after the commencement of the symptoms.

Post-mortem.—Escape of a large quantity of blood; uterus large, soft and pulpy. Transverse rent at the fundus of the peritoneal coat, and not implicating the muscular coat; posteriorly a zigzag rent, involving the superficial fibres, and opening a large vein from which the hemorrhage had occurred.—*Dr. Lever. Lond. Lancet*, Feb. 1846, p. 588.

Case CCLVI.—Æt. 47—borne no child for six years; rupture about twenty-five hours from the first of the labour; pains vigorous, and ceased gradually; no bad symptoms for five hours; one hour after rupture died undelivered.

Post-mortem.—The fœtus in the peritoneal cavity, excepting the head, which was impacted; walls of the uterus "everywhere oily, and of a soft and doughy feel; rent in front to the left, where the walls were exceedingly thin and softened, and of a deep red." *Dr. Elliot. N. Y. Annalist*, Oct. 1846, p. 7.

Case CCLVII.—Æt. 40 to 45—mother of four; previous labours easy; duration of labour a little less than thirty-six hours; labour favourable; within a few hours after its commencement she complained of weakness, which continued with occasional rigors until death. These, the only symptoms that could be learned by inquiry. A few moments before death a rigor, and a sudden noise in the abdomen, as if the escape of a body from a confined place. Died undelivered; rupture probably took place at the time the weakness came on.

Post-mortem—Two hours after death; a large quantity of sero-sanguineous fluid of dark colour, and slightly offensive smell; child enormous, completely in the abdomen with the placenta; uterus contracted, with a transverse rent, admitting the hand about the junction of the cervix and the body. "Nothing like thinning or disease of any kind in the uterine walls;" rupture owing to the great size of the head, which could not have passed the brim, and which was indented by the "immense force."—*Dr Wragg. South. Med. Journ.*, March 1847, p. 146.

Case CCLVIII—Æt. 23—first child; after a labour of over forty-eight hours; with extreme rigidity of the os uteri; the whole os burst off; delivered by perforation; the head being low down. Died after eleven days.—*Dr. Lever. Guy's Hos. Reps.*, Oct. 1845.

Case CCLIX.—Æt. 20 to 30—had regular pains for two hours, when she had sudden pain in the abdomen and nausea; great irritability, faintness and restlessness followed. Died in fourteen hours undelivered.

Post-mortem.—Forty to fifty transverse lacerations on the posterior surface; none over one-twentieth of an inch in depth; from one-fourth of an inch to two inches in length, and occupied nearly the whole posterior surface.—"*Dr. C. M. Clarke*, from *Trans. Improv. Med. and Surg. Knowledge in Dub. Med. Jour.*, vol. v. p. 324.

Case CCLX.—Delivered in a former labour by forceps; presentation natural; no distortion of the pelvis; towards the end of the first stage of labour, the pain ceased; presentation receded: considerable hemorrhage followed; dark coloured vomiting took place. Died undelivered.

Post-mortem.—The whole contents of the uterus were in the peritoneal sac, with very little blood. An immense rent of the lower part of the uterus and vagina on the left side, the edge of which was of a dark red colour, and as soft as jelly; softening had affected nearly the whole womb, but not from decomposition.—*Dr. Robert Lee's Midwifery*, p. 434.

Case CCLXI.—Second child; membranes ruptured early; pains became exceedingly violent; at the end of about fifty hours from the escape of the waters, the os being of the size of a shilling, during an examination, under a strong pain, the os split on the right side a considerable distance up through the cervix. Died on the fourth day of uterine inflammation.—*F. Ramsbotham, op. cit.*, p. 183.

Case CCLXII.—Mother of nine; anasarca and ascites during pregnancy; the os from the beginning was thick, soft, puffy, and œdematous; when a little above the size of a crown-piece, during an examination under a strong pain, the cervix was rent upward, posteriorly; child immense. Died on the fifth day.—*Ibid.* p. 184.

Case CCLXIII.—Third labour; the first instrumental, the second difficult; in labour from Saturday until Monday-noon; head presentation; contraction of the superior strait; very little progress. In the absence of the physician, alcoholic drinks were freely given to increase the pains, in place of the opiates which were ordered. Had a sudden, severe pain in the side like a stitch; pains began to diminish, and soon ceased; and died in two hours.

Post-mortem.—Cervix uteri torn across half way round the organ; the head impacted; body, limbs and placenta in the peritoneal cavities.—*Dr. Post. N. Y. Jour. Med.*, May 1847.

Case CCLXIV.—Sixth labour. During a "tremendous pain," she felt something give way in the region of the uterus; the pain immediately ceased, and was renewed slightly two or three times. Frequent pulse; tender abdomen; anxious countenance; lips swollen and somewhat livid; and begged for delivery. Some hours after, the os was contracted as after labour; the vagina extensively rent at its junction with the cervix, and entirely detached to the left, and in front; fœtus and placenta in the peritoneal cavity. Delivered by version, which occupied thirty minutes; the hemorrhage had been slight; bore the operation well, and felt gratified. Died twenty-four hours after rupture.—*Dr. Workman. West. Journ. of Med. and Surg.*

Case CCLXV.—Æt. 36—robust; sixth labour; previous deliveries artificial; labours painless; pelvis well formed, and of good dimensions; pains feeble and infrequent for the most part. After several hours, she had a severe pain which she thought moved the child; neither child nor os could be felt; distress, vomiting, and faintness soon followed. These abated, and she was bled for severe pain at the pit of the stomach; suffered greatly for two days, then became gradually more comfortable. On 16th day, had a profuse discharge of waters. By the 20th day, the abdominal integuments sloughed around the umbilicus; her size was less; discharges very offensive; she was sinking rapidly. An incision of eight inches was made, and the child withdrawn; the placenta separated and removed; the cavity was formed by the viscera glued together, and the peritoneum of the parietes, thus shutting off all connection with the rest of the abdomen; and contained putrid blood and water. Four days after this, injections thrown up the vagina passed out of the abdominal incision. Little fever followed; felt greatly relieved, and was about the house in five weeks; menses returned, and she became strong.—*Dr. Snell. Journ. Maine Med. Soc.*, 1834, p. 1.

Case CCLXVI.—Æt. 44—several children, and generally easy labours. Had been in labour twenty-four hours; pains very strong; child low down, pressing on the perinæum; shoulder presentation; version without difficulty. On removing the placenta, a rent of about four inches was felt over the pubes; rigors and vomiting came on. Died in about twenty-four hours after delivery.—*Dr. Ayer. Ibid.*, p. 8.

Case CCLXVII.—Æt. 34—mother of three or four. After about twenty-four hours, the pains at first light and trifling, and afterward abating; waters evacuated and funis prolapsed; the vectis and crotchet were tried, and failed. She only complained of great soreness and distress about the umbilicus. After a few hours she sank and died, undelivered.

Post-mortem.—A knee of the child passed through a rent in the anterior part, four or five inches long; and running from the cervix toward the fundus; a large quantity of blood in the abdomen. *Ibid.*, p. 9.

Case CCLXVIII.—Æt. 42—mother of several. Physician had been with her

twenty-four hours; an arm presented, and the chin and mouth were to be felt; an attempt to turn failed; great distress in the abdomen, a large tumour could be felt in the epigastrium; a foot could be felt, and its toes; vomiting now came on, which lasted for about fourteen hours, till she died undelivered.

Post-mortem.—Fœtus all in the abdomen; body of the uterus nearly separated from the cervix, and connected to the vagina only by a small portion; the uterus was putrid.

Rupture had taken place early or before labour, as there was nothing like labour pain after the rupture of the membranes.—*Ibid.*, p. 10.

Case CCLXIX. Died five months after rupture; part of the fœtus having escaped by the anus; fœtus putrid, and viscera disorganized; rent apparently very large; *cicatrized*, except for eight or ten lines. *Ibid.*, from *Recueil Period. de la Soc. de Méd. de Paris*, tom. x. p. 268.

The following communication, with the interesting cases appended, is from Dr. Channing, Professor of Midwifery in the Medical School in Harvard University, whose extended experience in the practice of obstetricy has afforded him opportunities of seeing numerous examples of this accident.

Boston, Aug. 30, 1847.

Dr. J. D. Trask:—

Dear Sir:—Enclosed are rough, very rough notes of cases of ruptured womb, which have more or less directly come under my notice. You will not regard them as occurrences in my practice, or that of any other single person. I know of but one physician who has had *two* cases in his own practice. I have not had one in my own. Physicians may and do pass whole lives without observing cases which may not be rare in those of others, and this too without the least suspicion of their want of skill, or of knowledge. * * *

I have other cases, I think, but my notes are not at hand, which I regret, as it would give me pleasure to have sent you the whole.

The recoveries in my cases, are about ten per cent. * *

I remain your friend, &c.

W. CHANNING.

Several cases of ruptured womb have occurred here. In four of them the women were not delivered.

[Case CCLXX.]—In one of these, in which I was especially consulted, the woman refused to have anything done after rupture occurred. In another,

[Case CCLXXI]—the medical attendant preferred that the case should be left to nature.

[Case CCLXXII.]—In a third, the child was turned, and advanced well, until the head was to enter the brim. Here was delay. The woman said, "I am dying; will you stop till I am dead?" She died in a few minutes, and it was then very satisfactorily ascertained, that the diameter (the conjugate) of the brim was so much diminished as to prevent the entrance of the standard fœtal head, except by very powerful effort, and it was during such, as I was informed by the medical attendant, rent occurred.

[Case CCLXXIII.]—In a fourth case in which I was consulted, death occurred before delivery; and, because, of the opposition of the patient to any operation. I examined the woman after death. The fœtus was lying among the intestines. The womb was well contracted, presenting a flattened thick mass, perfectly white, except in the part of it in which rupture had occurred. Here it was *thin*, thin as a *membrane*, and perfectly black. The contrast between this state of things, and of that which bordered it, was most striking. The extent of which the *thinning* process had extended, was a space judged to be equal to the surface of two hands' breadth. It was through the centre of this the child had escaped. It was in a portion of the womb which very exactly corresponded to one in the

abdomen—viz: the left iliac region, and extending upward from that—in which the woman had experienced much soreness and tenderness, in the latter months of pregnancy, and which she ascribed to her habit of resting that part of the uterine tumour against the washing-tub, at which she almost daily worked, for self-support, and to support her family. There is another fact of interest in this case. The head, which had been forced fairly down into the pelvis by the pains, *did not in the least recede* after rupture, but remained just where it was before the rent occurred. Nay more, so fairly impacted was the head, that it was with great difficulty that I could draw it back again, after opening the abdomen, and to do which I was desired to make the *post-mortem* examination. A writer has recently advanced the doctrine, that in a majority of cases of rupture, there is preceding, and predisposing disease of the womb. This opinion has some confirmation in this case. There was found a state of the organ, or a part of it, entirely different from its condition elsewhere, and which was certainly preceded by symptoms denoting a morbid condition of the part.

In *two* cases *dropsy of the fœtal head* existed. The water was discharged by perforation after turning, and because the head could not pass until reduced in size.

[Case CCLXXIV.]—In one of these, sudden and excruciating pain in one groin and above it, immediately preceded the rent, perfect repose following the accident. The woman survived till the fifth day, promising to do well, and then rapidly sank without the supervention of disease which was marked by any distinctive symptoms.

[Case CCLXXV.]—In the other case, death occurred soon after delivery.

In two cases a remarkable lesion of the womb was discovered after death, and which seemed allied to a morbid condition which might have preceded labour, but in which labour was the exciting cause of the lesion alluded to. In both the placenta was retained.

[Case CCLXXVI.]—In the first, I saw the woman some days after the delivery of the child, on account of symptoms resembling very nearly those of puerperal peritonitis. I was told that the placenta was retained, and that the woman had suffered much since the birth of her child. I found the placenta projecting somewhat beyond the os uteri, and that it was moveable. I brought it away. It was cylindrical in shape; long, round; of a light gray colour and very firm, as if it had been strongly compressed by the womb. Some temporary relief followed its removal, but in a few days after symptoms of grave peritoneal inflammation came on, and the woman died.

Upon examination, sero-purulent effusion, with masses of floating lymph were found in the abdomen. The womb was found contracted, but in shape corresponding to that of the placenta, and at the top of it having an opening which communicated into its cavity and with that of the peritoneum. An abscess had formed in the substance of the womb at its fundus, and from this pus was passing into the abdominal cavity.

[Case CCLXXVII.]—In another case; the second of the above, of anomalous uterine lesion, labour in its two first stages was well accomplished. The placenta was retained. The cord parted; attempts were made to deliver the placenta. They failed. I saw the patient at this time and advised, after an examination, to make no farther forcible effort to bring away the placenta, but to wait, and to be governed by circumstances. The patient was for a few days comfortable. Then signs of peritoneal inflammation occurred. She was seized with very severe and forcing pains. Examination was made, but the os uteri was found firmly closed and would not admit of passing the hand or a finger. The pains at length subsided. The patient sank and died. Death occurred more than a week after the child was born.

Upon examination the uterus was found at its fundus, to have experienced a lesion through which about half of the placenta was found protruding from its cavity into that of the abdomen. The opening was circular; a form which wounds in the womb are apt to assume, in consequence of the equal action of its muscular fibres.—(See *Charles Bell on Muscularity of the Uterus.*)

Rupture of the womb is often preceded by very violent and distressing pain, in the midst of some one of unusual severity, the organ gives way.

[Case CCLXXVIII.]—A case occurred in which nothing of this kind happened. Labour; second child; was wholly natural and easy. The physician was surprised to find, on examination after a pain, made to ascertain what was the progress of the labour, that the head had receded from the position it had just before occupied. Not that it had merely done so as is common during the uterine relaxation which follows pains, but that it had much exceeded the ordinary measure. He found that by gentle pressure the head receded more and more, and soon being left to itself, that it entirely passed out of the pelvis. Rupture was thus at once declared and soon showed its ordinary effects. The child was delivered by turning. It was found entirely out of the womb, and lying among the intestines.

Reaction now took place; no violent symptoms attended this; the patient was comfortable. She lived five days after rupture, and in a condition so slightly morbid as almost to have encouraged hopes of recovery. I learned the above particulars of this case from the medical attendant; not having seen it till at a meeting for a *post-mortem* examination which circumstances prevented.

[Case CCLXXIX.]—I was one day dining with a friend in the country. He told me his gardener's wife had been in labour that day, and that the womb had given way, and she was not delivered. I went in to see her. I found her much sunken, restless, vomiting, cold, pulse small and very rapid. Her appearance was miserable enough. I now learned that the rent had occurred at 11 A. M. I told my friend that I should much like to see the physician, and he was sent for. He came between three and four P. M. and after consultation, it was agreed that an attempt should be made to deliver. I began the operation at four o'clock. Upon passing the hand, the pelvis was found perfectly empty, and at the anterior part of the abdomen, just beyond the symphisis pubis, I felt a hand of the fœtus, its fingers being toward my hand. I passed my hand, guided by the fœtal arm, till I reached the trunk, and then the feet, and gently brought them down. The turning was now accomplished, and an opiate given. Mrs. T. now rallied. Her stomach became quiet; pulse, &c., improved, and there was no more constitutional trouble than so grave a lesion should be accompanied by. This state of things continuing some days, she suddenly sunk on the fifth day and died.

Upon examination it was discovered that the rent had occurred, and extended from points corresponding to the superior and anterior spines of the ilia. It was a wide gaping fissure, so much so that you looked through it, directly across the neck, to its posterior face.

[Case CCLXXX.]—I have seen another case in which the rent was transverse of the collum uteri. This was a first labour, patient between thirty and forty years old. The labour was long, but in no sense a severe one. Rupture was attended by subsidence of pain, sinking and recession of the head of the fœtus. This last was not so entire as to prevent the use of the forceps. This woman died *seventeen* days after the rupture. I saw her because of symptoms indicating severe disease in the abdomen. For some days recovery was looked for. She sunk at last without any severe precursory trouble, and till late, especially, free from the ordinary signs of grave peritoneal or abdominal disease.

She was examined after death, and the evidences were strong of much more grave lesions than were indicated in the ordinary way during life. Adhesions had taken place extensively in the organs in and about the place. Abscesses were discovered in the place where adhesion was most marked. Rupture had taken place *directly across* the neck of the womb in its posterior face, and was about one and three-fourths inches in length. Contraction had taken place and explained the small extent occupied by the rent. Its edges were ragged, and gave no proof that restorative process had taken place.

[Case CCLXXXI.]—In one case of rupture death had occurred before I reached the house. The rent, as discovered by dissection, was *longitudinal*, of great extent, and involving the neck and vagina, a very usual complication. The womb was not at all contracted.

[Case CCLXXXII.]—A case occurred in a neighbouring town. The child was turned and brought away. Death occurred soon after. In this case the rent was of great extent, the hand passing freely into the cavity of the abdomen.

[Case CCLXXXIII.]—I attended a woman some years ago, and after the birth of

the child, I had occasion to pass my hand into the womb to ascertain what caused retention of the placenta. I first reached a mass projecting from the womb, which I soon ascertained was not the placenta: and being guided by the cord reached the placenta, separated, and removed it. The woman did well. In her next labour, she employed another physician. The arm presented. Another physician was called in, and turning agreed on. This was done Soon after the woman sunk and died.

Upon examination, a large polypous tumour was found projecting from the os uteri, and a large rent of the womb, involving the vagina. I examined the womb after it was removed, and found it to be perfectly uncontracted, presenting a large organized bag, with a tear through much of its length. It is very probable that, in this case, the dragging of the child through the os uteri, partially filled as it was by the polypus, and the resistance of this last to the progress of the fœtus, probably led to the accident.

[Case CCLXXXIV.]—Case of circular polypus; polypus surrounding the os uteri. In this case the patient had suffered for some time from descent of the womb, so that it was external, and the tumour was thus distinctly diagnosed. The polypus sprung from the edge of the mouth of the womb, by a very thick base, and of singular firmness. She suffered much by menorrhagia, or uterine hemorrhage. She became pregnant, and when examined during labour, one of the *upper extremities* was found presenting. I was called to see her. She lived about thirty miles from Boston, and when I reached the address, I found the labour was over, the medical attendant having delivered by turning. The child was dead, and, from the separation of the skin everywhere, and much distension from gas, it was pretty clear it had been dead some hours. Two or three ruptures had occurred in the circumference of the polypus, one of them very deep, and which I carefully examined, extended into the mouth and neck of the womb. The other rents were less distinct. This woman recovered. It certainly was a case which, in its extreme complication and previous history, seemed to present the least prospect of recovery; still it did well.

The treatment was mainly resolved into such a use of opium as would positively prevent pain, and keep the bowels perfectly quiet, and this for days; such a use of calomel as would secure alterative effects, and limit inflammation as far as possible to such a degree of it as might be necessary for the establishment and continuance of the restorative process, and such an employment of the catheter as would supersede the natural functions of the bladder. The use of opium was suggested by what is known of its beneficial effects in some cases of perforation of the intestines in typhoid fever, and from other causes; of calomel, from its supposed power to control inflammation, or to keep it within the demand. The result of the case, whatever may have been the therapeutic doctrines or agencies, was wholly satisfactory. The case was one of questionless rupture, and the patient recovered.

[Cases CCLXXXV., CCLXXXVI.]—Two cases have occurred, one of which came under my notice, and the post-mortuary appearances of both of which I have examined, which were of much interest, as showing how fatal may be the consequences of apparently very slight uterine lesions occurring in labour. In these cases the only uterine tissue which had given way was the peritoneum. In one of them much more extensively than in the other, and principally about the origin of one of the Fallopian tubes. The lesions consisted in fissures of the *peritoneum*, as if it had been cut through with a knife. This form of rupture, if such it can be called, has been described by the late Dr. Clarke, brother of Sir Charles Mansfield Clarke, so distinguished by his writings on the diseases of females. Dr. C. describes cases of sudden death after labour, preceded by symptoms closely resembling those of rupture, and in which no other lesion was discovered after death, than the peritoneal fissures referred to.

[Case CCLXXXVII.]—Two cases of rupture occurred in the practice of the same physician, and to which he called me in consultation. The first was a case of exceedingly easy labour. It was long and troublesome, but it was almost painless. Ergot was given to increase pain. Rupture happened without any warning,

and was followed by its ordinary signs. The child was turned. Death took place a day or two after delivery.

[Case CCLXXXVIII.]—In the second of these cases, the labour was severe. The exceeding destitution of the patient made her case much more wretched than it might, under other circumstances, have been. The child was turned, in a state of hopeless exhaustion of the woman, and death soon took place.

[Cases CCLXXXIX., CCXC.]—I have met with two cases, in which rupture was limited to the *vagina*. In both of these, death occurred, and under circumstances similar to those which mark the other cases in this paper.

[Case CCXCI.]—A case occurred here five or six years ago, in which rupture happened without its accustomed precursors of severe pain, or local symptoms indicating disease of the womb. The woman was most unfavourably situated, being one of our most wretched, squalid Irish. Her labour proceeded without unusual violence, until it was noticed that the head, the presenting part, had receded, and was at length out of reach. Turning was resorted to soon after, or as soon as a consulting physician was found, and the child brought from the peritoneal cavity through the natural passages. There was no question of rupture, as the child was found lying among the intestines. The symptoms immediately produced by rupture, and those which followed, were strongly marked. Still she lived on. At length, when apparently doing well, she became dissatisfied with her regular medical attendants, dismissed them, and sent for some one else; and, notwithstanding the utter wretchedness of her condition, and severe privations, she perfectly recovered. She has had a child since, and did well.

[Case CCXCII.]—The latest case to which I refer, is of recent date. Circumstances were deemed to make it necessary to apply the forceps, while the head was yet above the brim of the pelvis. The effort failed. The forceps were well applied, and all safe force used. The perforator was next resorted to, and then the crotchet. After as many as four hours of uninterrupted effort, the child was delivered. Very soon after, the symptoms of ruptured womb showed themselves. These were rapid pulse, cold, damp skin, restlessness, sinking. But a symptom most relied on, was the occurrence of a tympanitic enlargement of the abdomen, in which the distension was suddenly produced, and which soon became of great size. The skin seemed stretched to the utmost, so thin, in short, as to show that the distending air was very near to the surface. The woman died the morning following delivery. An examination was not permitted. I have no question of the accuracy of the diagnosis in this case, as the physicians in attendance had observed unequivocal examples of the uterine lesion under consideration.

Of the above, in *four* death occurred before delivery. In two after the opposition of the patient to any operation for her relief. In a third, the physician thought it not expedient to operate. In a fourth, the patient being conscious of coming death, asked that the removal of the child might be deferred till after that event.

In *two* cases dropsy of the head existed.

In *two* cases the placenta was retained, it being impossible to remove it until after death, in one, and until a short time before death, in the other. In both, the womb was found communicating with the peritoneal cavity, in its fundus—and in one in which the placenta had not been delivered, it was projecting from the womb into the cavity of the abdomen.

In *two* cases the rent was *transverse*. In one of these it was across the *anterior* part of the womb, corresponding to the brim of the pelvis; the woman living five days. In the other it was across the *posterior* face, the woman surviving seventeen days.

In *two* cases polypus existed. In both of them the *upper extremity presented*. In one the polypus arose from the inside of the organ by a pedicle. The child was turned; the woman died soon after, and an examination showed a longitudinal rent of the womb of great extent, involving the os uteri. In the other, the polypus was *circular*, surrounding the os uteri.

In this the child was turned, and recovery followed. The ruptures here, for there were more than one, involved the polypus and os uteri.

In *two* cases rupture was confined to the *peritoneum;* both fatal.

In *two* cases rupture limited to *vagina;* both fatal.

In *two* cases recovery."

The following is from a communication with which we have been favoured by the politeness of Prof. C. D. Meigs, of Philadelphia.

"I have met with a few cases of rupture of the womb in labour, all of which proved fatal within some twenty or thirty hours.

The cases that have fallen under my notice, have not been recorded by me, and I cannot, therefore, give you the particulars of them. I am aware that some of them, at least three, followed the ergotic contractions induced by the imprudent exhibition of secale cornutum.

[Case CCXCIII.]—In a case that occurred this spring, the gentleman administered the ergot at midnight, or a little later, and the child escaped into the peritoneum at about 2 A. M. Her fate was announced—but as she lingered longer than was expected, I was called at 7 P. M.

I proposed to perform gastrotomy; but as the child could be touched through the rent in the vagina and cervix, it was deemed unadvisable to execute this purpose. Whereupon I withdrew it, by means of my craniotomy forceps, after making perforation of the cranium. The woman was sensible, though pulseless all the while, and quite conscious of her dying state. The operation was most fatiguing to me, and painful and exhausting to her, as the child was very large, and the pelvis a very bad one, which had caused laborious labours before. She survived the extraction for some hours.

A post-mortem examination showed me, that it would be far more humane in all such cases to extract the child by a gastrotomy operation, as the least painful, and least mischievous. I bitterly regretted having changed my purpose, and am now fully resolved in all future cases of rupture and escape to open the abdomen. I admit that a woman might recover, the child being left unextracted, but such good fortune is never to be expected. A hasty and speedy removal of the child and secundines gives, in my opinion, a chance not greatly inferior to that in Cæsarean section."

The following case occurred in the practice of a friend in this city, by whom we were requested to see the patient soon after the occurrence of the accident.

[Case CCXCIV.]—*Dec.* 23d, 1846.—At 3 A. M., we first saw the patient. Her condition was as follows. She lay upon her back with the knees partially drawn up; countenance pale and denoting great anxiety; face and upper extremities bedewed with perspiration; the lower extremities cold; was almost insensible, and when aroused complained of pain and soreness in the abdomen; pulse exceedingly rapid; the abdomen very sensitive to pressure; and the distended bladder felt distinctly above the pubes.

The doctor stated that he was called to the patient between nine and ten o'clock the preceding evening. He was told that pains came on about midday, when a midwife was called in, who soon left, believing that labour had not commenced. Unfortunately she returned in the evening, and left indubitable evidences of her officiousness: the labia being greatly swollen and livid; and the poor patient assured the doctor that this woman had "pulled her almost to death."

At the time of the doctor's arrival, the pains were moderate and even, as he considered, of deficient force, seeming rather dilating than expulsory. The head was in the cavity of the pelvis, about entering the inferior strait; the brow presenting, and the outlet was somewhat diminished in its transverse diameter. The patient had been delivered one year before of a living child, by means of forceps. Pains being so moderate that no suspicion of any danger to the uterus could be excited, and the bones of the head being very movable, the doctor determined to trust awhile to the efforts of nature.

Under this condition of things, about a quarter past two o'clock, she suddenly complained of faintness, and at the same time expressed a belief that something had given way within her. Two or three feeble pains followed; vomiting ensued; the head retreated from the inferior strait, and she fell into complete collapse. Brandy was freely given her but rejected.

This was from one-half to three-fourths of an hour before our arrival. Notwithstanding the feeble character of the pains up to the time of the accident, there could be no doubt that rupture of the uterus had taken place. It was agreed to continue administering brandy freely for awhile in order if possible to bring on reaction. A gum catheter was introduced, and about a pint and a half of urine drawn off, of the colour of strong coffee; an attempt to introduce the silver catheter some time previous, had failed. A hard tumour was now felt in the right side of the abdomen just below the margin of the ribs, presenting about the size and feel of a contracted uterus after delivery; below it nothing could be distinctly felt through the abdominal walls, the whole abdomen being, in fact, too sensitive to permit of any accurate examination. During twenty or thirty minutes she took over half a pint of brandy which she retained; under its influence, intelligence returned; the countenance brightened; and she had considerable strength to assist in changing her position. There was not, however, a corresponding improvement of the pulse, and it was agreed that the only chance for herself or child was immediate delivery, though little expectation could be entertained of saving either.

The space between the tuberosities of the ischia appeared to be less than three and a half inches. The head rested on the brim of the pelvis, with its long diameter corresponding to the transverse diameter of the superior strait, and movable. Some blood flowed from the vagina when the head was disturbed. Version was contra-indicated by the contracted outlet; the choice was between the perforator and forceps, and though no attempt was made to ascertain if the child were alive, because of the difficulty of distinguishing the pulsations of its heart from those of the iliac arteries of the mother, which were now as frequent as those of the fœtus; yet in order to give it a chance, if alive, the forceps were selected. The blades were introduced without difficulty, and just being locked, when it became apparent that the poor creature was sinking. The forceps were accordingly withdrawn, the patient replaced upon the bed, and in a few minutes she expired.

Post-mortem.—Four hours after death whole surface of the body blanched. Abdomen very tense and distended; contracted fundus felt in the right side, and could be grasped in the hand; in the left hypochondrium a limb could be felt on deep pressure. Upon laying open the peritoneal cavity liquid blood gushed out, and from three to four quarts were removed. The fœtus lay in the left side of the abdomen, the head only remaining within the uterine cavity, the lacerated edges contracted around the neck. The placenta was lying in the peritoneal cavity, a small portion only remaining still attached to the fundus uteri. The fundus and the portion of the body not surrounding the head of the fœtus was firmly contracted. She had evidently perished from hemorrhage.

The rent was irregular and ragged, involving the posterior and lateral aspect of the cervix, running up into the body of the womb and down into the vagina. The womb was apparently somewhat thinned at the place of rupture.

Professor Bedford, of the University of New York, has kindly furnished us with the six following cases, additional to those already quoted from his valuable additions to *Chailly's Midwifery*.

[Case CCXCV.] *Oct.* 10, 1844.—Mrs. H., of Williamsburgh, was taken in labour with her fourth child. When labour commenced she sent for a midwife; shoulder presentation; arm came down; midwife made violent traction on it. Fourteen hours after labour began I was sent for; found the patient much prostrated, with more or less constant vomiting; child undelivered; mouth of womb relaxed. I turned, and delivered her of a living son. Neck of the uterus had been ruptured by rude manipulations of the midwife. Patient recovered after four weeks extreme feebleness.

[Case CCXCVI.] *Dec.* 9, 1844.—Dr. Burtsell sent for me to see Mrs. A., who had been in labour four days. Before Dr. B. had arrived, a physician in attend-

ance had administered ergot freely. The pelvis, though not deformed, was small. Vomiting and prostration; head at the inferior strait. The woman's strength failing, I applied the forceps, and delivered her of a living son. After-birth was retained; introduced the hand to remove it, and found a small rupture in the anterior surface of the womb just above the cervix. Patient recovered in two weeks without one untoward symptom, except great weakness.

[Case CCXCVII.] *June* 14, 1844.—I visited a patient of Dr. Ostrom, in New Jersey; patient in labour thirty-seven hours when I first saw her. Pains had been violent, but no progress in the labour, except the mouth of the uterus was dilated to the extent of a four shilling piece. The patient possessed an extremely rigid fibre; ordered bleeding to twenty ounces, followed by a solution of tartar emetic. Pains continued vigorous; mouth of the womb dilated a fraction more, and became softer; no further progress in delivery after six hours. During a violent pain, something was heard to *give way;* this was followed by vomiting and great prostration, with cold extremities. I suggested the propriety of *turning*, and performed the operation, and delivered the patient of a *living* son. The womb was ruptured on the left of the cervix, and the patient survived twenty-four hours.

[Case CCXCVIII.] *Jan.* 18, 1846.—Mrs. N., in the ninth month of pregnancy, was struck on the abdomen with a stone. Labour came on, with vomiting and sickness; cold extremities, &c. &c. There was rupture of the womb. She was delivered naturally in four hours of her third child. Died in twelve hours from the effects of rupture.

[Case CCXCIX.] *March* 3, 1845.—Dr. Reiley requested me to see Mrs B. with him. She had been in labour ten hours when I saw her; no progress notwithstanding violent contractions. On examination, found the cervix in a state of scirrhus, and rupture at the fundus. The child had partly escaped into the abdomen. The woman died three hours after my arrival. The abdomen was opened, and the child removed. If I had arrived in time, I should have laid open the mouth of the uterus with a bistoury.

[Case CCC.] *Jan.* 16, 1847.—I was requested by Dr. Thomas to visit a lady in West Chester, who had been in labour twenty hours. The arm protruded through the vagina, and had been in this situation for six hours. Patient had suffered most acutely from violent and increasing pain. One hour before I had arrived she was seized with great prostration and vomiting; there was rupture of the cervix; pelvis small, though not deformed. I turned and delivered her of a living daughter. The mother recovered in two weeks.

"These six cases, with the five mentioned in my note in Chailly, eleven in all, are the cases I have met with in my practice. Of these eleven, in three the mother recovered, and four children were delivered alive. You will please remember that in every case I was called in consultation."

Dr. Wm. R. Wagstaff, of New York, late Resident Physician of the Lying-in Asylum, during a practice of eight years, in which he has attended nearly twelve hundred patients in their confinements, has had three cases of rupture of the womb. The first is Case CCIII. of our series.

[Case CCCI.]—"The second was in a patient of Dr. Ira B. Blakeman. She was a strong, healthy Irish woman, who had given birth to three full-time living children, without any preternatural difficulty. In this labour, her fourth, the doctor was summoned in the evening, and upon examination, found a natural vertex presentation, parts dilatable, pains recurring at proper intervals, and not unusually forcible; in short, all the evidences of an easy, natural labour. The membranes gave way soon after the os was fully dilated, and as the head was engaging in the superior strait; in half an hour after their rupture, the head being in the inferior strait and pressing on the perineum, during a pain she exclaimed that something had snapped in her side." The pain instantly ceased, and there was no recurrence of contractions of the uterus afterwards.

I was immediately summoned by Dr. B, and arrived about an hour after the accident; she was then complaining of a continuous lancinating pain in the epi-

gastric region, with constant vomiting. I applied the forceps to the head, and delivered at once without difficulty. The child was a male, weighing about seven pounds [and dead]. No contraction followed the delivery of the child, and upon passing my hand into the cavity of the uterus for the purpose of exciting contractions, and effecting the delivery of the placenta, I found a large quantity of intestines protruding into it through a laceration of considerable extent on the anterior side near the fundus. No contraction of the uterus ever took place, nor could reaction be established, although stimulants were freely administered. She died fourteen hours after delivery. A post-mortem examination was denied.

[Case CCCII.]—In the early part of this summer, I was called to attend Mrs. C., a strong, healthy woman, in labour with her fourth child. Her first had been born without any artificial assistance, after a protracted labour of five days. Her second was delivered by instruments. Her third I had delivered with instruments thirteen months previously, at the request of her attending physician, on account of inertia of the uterus. When summoned to attend her in her last confinement, I found upon examination a vertex presentation, os uteri dilated fully, parts flaccid, pains forcible, but not unusually violent, and everything progressing naturally. In a short time the membranes ruptured spontaneously, and in a half hour afterwards, the head having reached the inferior strait, she experienced a sensation of something giving way during a pain, which immediately ceased. Having waited for fifteen minutes, and observing no recurrence of the propulsive efforts of the uterus, and being alarmed by her continuous complaint of a sharp lancinating pain in the epigastric region, I made examination *per vaginam*, and found that it was impossible to reach the child, and that the os uteri was firmly contracted. On passing my hand over the abdomen I distinctly felt the fœtus beneath its parietes, and low down, just under the arch of the pubes, a firm, hard ball, which I at once recognized as the contracted uterus. On account of the difficulty always attendant upon obtaining a medical consultation in the night, it was four hours before the operation of gastrotomy was performed. In the presence of Drs. Powers, Whittaker, and several others, I opened the abdomen through the *linea alba*, and found the child and secundines in the cavity of the peritoneum, together with a large quantity of blood and water, all of which was carefully removed, and the uterus firmly contracted, and down in the cavity of the pelvis. The child was a male, weighing nine pounds, and dead. The lips of the wound were brought in apposition and retained by six sutures. It was found necessary to administer stimulants freely during the operation, and in fact during the whole residue of her life. She never so rallied as to admit of the abstraction of blood, nor was it thought advisable to apply blisters. Twelve hours after delivery she commenced discharging from her stomach a large quantity of dark green-coloured fluid, mixed with such nourishment as had been taken, amounting to more than a gallon in twenty-four hours, and this she continued up to the time of her death, which took place six days after the operation. Her bowels were daily evacuated by the excitement of enema. Ice was kept constantly applied over the abdomen. The upper part of the wound healed by the first intention, the lower part remained open, and through it there exuded continuously a greater or less quantity of bloody fluid. I regret that no examination, *post-mortem*, could be obtained.

Case CCCIII.—A specimen of rupture of the anterior wall of the uterus and of the bladder, by the forcible introduction of the forceps.—*Museum of New York Hospital, presented by Dr. Watson.*

In the next number of this Journal we propose to consider the symptoms of rupture of the uterus, the cause, both remote and proximate, of this accident, its pathology, and the most successful mode of managing it, as deduced from the cases we have collected.

REVIEWS.

ART. XII.—*A System of Surgery.* By J. M. CHELIUS, Doctor of Medicine and Surgery, Public Professor of General and Ophthalmic Surgery, Director of the Chirurgical and Ophthalmic Clinic in the University of Heidelberg, &c. *Translated from the German, and accompanied with Additional Notes and Observations.* By JOHN F. SOUTH, Late Professor of Surgery to the Royal College of Surgeons of England, and one of the Surgeons to St. Thomas's Hospital. 3 vols. 8vo. pp: 2148. Philadelphia, 1847.

New Elements of Operative Surgery. By ALF. A. L. M. VELPEAU, Professor of Surgical Clinique of the Faculty of Medicine of Paris, Surgeon of the Hospital of La Charité, Member of the Royal Academy of Medicine, of the Institute, &c. Carefully Revised, entirely Remodeled and Augmented with a *Treatise on Minor Surgery.* Illustrated by over 300 Engravings, incorporated with the text: accompanied with an Atlas in quarto of 22 Plates, representing the Principal Operative Processes, Surgical Instruments, &c. First American, from the last Paris Edition. Translated, by P. S. TOWNSEND, M. D., Late Physician to the Seamen's Retreat, Staten Island, New York. Augmented by the addition of several hundred pages of entirely New Matter, comprising all the Late Improvements and Discoveries in Surgery, in America and Europe, up to the present time. Under the supervision of, and with Notes and Observations by VALENTINE MOTT, M. D., Professor of the Operations of Surgery, with Surgical and Pathological Anatomy, in the University of New York, Foreign Associate of the Académie Royale de Médecine of Paris, of that of Berlin, Brussels, Athens, &c. In 3 vols. 8vo: pp. 3180. New York, 1845–47.

THE two works which we have placed in association at the head of this article, have some striking features in common. They are both recent translations. They are both systematic compilations of great merit. They both assume to furnish a full-length portrait of the Surgery of the day; one of them having special reference to Operative Surgery; the other, without excluding this, giving more particular consideration to Surgical Pathology. Both works, in the original, stand at the head of their class; the one, in the surgical literature of France; the other, in that of Germany. They have both received, in the course of translation, a strongly marked extrinsic impress; the one, from the Surgery of America, or at least from an American Surgeon; the other, from the Surgery of Great Britain. They have both been notably enlarged; and as now presented to us, they both appear to have lost something of their primitive unity of purpose, and to have been diverted in some degree from the main purpose for which they were originally written.

Every author has, of course, the right to present his own productions to the public in such a shape as he thinks best calculated to give clear expression to his facts, or to subserve the ends of science. But we have some doubts as to how far the editor, translator, or commentator of another man's

works, should be indulged in altering their general scope. In books, as in pictures, statues, and buildings, there should be an artistic finish, a mutual relation and dependence of parts; with some rising into full relief, and others receding into shade, in just accordance with their relative importance. This rule, we admit, is far from being generally observed by our professional writers; in some of whose productions it would puzzle Longinus himself to find the slightest attention paid to any other rules of composition, than such as relate to the mere grammatical construction of sentences; and even these rules are too often disregarded. But where an author has evinced much skill in the arrangement of his materials, marked out his ground, reared his superstructure, and given to each portion of his performance its due consideration, it becomes the part of the critic, as well as of the public, to protect him against the ruthless innovations of remodelers, who, without perceiving the symmetrical construction of his whole work, would engraft notes and paragraphs and opinions upon it, with as little compunction or regard to relevancy, as if they were compiling for a daily newspaper. The productions of a useful writer are a sort of public property, which no man has a right to convert into a clothes horse upon which to suspend his wet sheets and washed linen.

We do not throw out these thoughts with more special reference to the works now before us, than to some others that are popular in our profession. The notes, comments, and additional materials, that have been incorporated with the work of M. Velpeau, as well as with that of Chelius, may, in some respects, enhance the value of the original. And the editors, in both instances, have given plausible reasons for the liberties they have taken. Thus, says Dr. Mott, in a letter addressed to M. Velpeau, and in his own peculiar manner:—

"I have taken thus the liberty to enter my name as a *compagnon de voyage* with you, upon the great high-road of the science, where it has been so long our cherished pride, fortune, and pleasure to travel. Because I felt that in associating my labours with those which have received the approbation of your judgment, and which your genius and untiring industry have wrought out in your estimable work, as an enduring monument to your fame, I might find an appropriate place and guarantee for indulging the ambition that I, like others, must naturally have of seeing legitimately transmitted, through an orthodox and approved organ, for the judgment of an impartial posterity, an authentic account at least (if only at best but an abrégé one) of my *stewardship* also in the great field of surgical science. This, so far as concerns myself, (and independent of perhaps paramount considerations, to give wider diffusion upon this continent to your great and useful work,) I felt admonished by the time of life at which I have arrived, to be due as well to myself and my own reputation, as to my country and profession.

"As such, then, my dear sir, I have ventured thus, while life is so short and art so long, to ask for myself a niche in the great edifice of surgical facts and truths of which you are the constructor and owner. I have to ask of you the privilege that I may be allowed within this storehouse, containing so much of the treasures of our science, to make safe deposit and registration of the detached fragments of the scaffolding at least, of that extended work of my own on Operative Surgery, which, as you are aware, I have for so long a time meditated, and of which these offerings must for the present be received as the pledge."—(Vol. I. pp. 10, 11.)

The first two volumes of M. Velpeau's Surgery, as translated by Dr. P. S. Townsend, of New York, with notes, &c., by Dr. Mott, have been for some time before the public; the last volume has appeared within the past few months. The work, from its size alone, has been one of great labour. As it now stands, it occupies three overgrown octavo volumes, the first of

which contains 914 pages; the second, 1190; and the third, not fewer than 1175 pages.

To one at all familiar with the original, as it came from its author's hands, it might have appeared already sufficiently circumstantial and voluminous. The advancements in the art of surgery, since its publication, the restless desire for improvements, and the public taste for novelties, would probably have asked of the author himself, had he been about to prepare a third edition of his book, some notice of newly devised operations, or some new modifications of old ones; and the medical public would doubtless have accepted with good grace, as much as this, or even somewhat more, from the editors of the present translation. But they have ventured far beyond this. "No pent up Utica contracts their powers." And if they have not "the whole continent" to themselves, they occupy at least a very considerable portion of it. "The entire *new matter* prepared for this edition," to use the words of Dr. Townsend, "will make, altogether, in the body of the work, some 1200 to 1500 pages."

Dr. Mott's contributions are; 1st, a short preface to the first volume; 2d, the republication of most, if not the whole, of his more important cases and operations in detail, as taken from the several medical periodicals in which they had originally been presented to the public; 3d, a chapter of about a hundred pages on the management of aneurisms and kindred topics; 4th, a short paper on rigidity of the lower jaw, which is the only contribution from his own pen that we have met with in the third volume. But, by the hand of his associate, Dr. Townsend, he has caused to be inserted in this, as in the other two volumes, many detached notes and comments on the text, with occasional reports of cases. So that in the whole work, without attempting great precision, we may estimate Dr. Mott's *addenda* at about 200 pages.

Dr. Townsend's share of the 1500 pages of new matter is not so easily identified. Besides innumerable shorter passages, paragraphs, and reports of cases and operations, collected from his friends, or drawn from his own resources, or condensed from the miscellaneous papers of M. Velpeau, his principal contributions to the first volume, are: 1st, a preface; 2d, appendices on strabismus, tenotomy, myotomy, &c., occupying some thirty pages or more; and, 3d, a concluding American appendix of nearly ninety pages, mostly devoted to anaplastic procedures. In the second volume, besides a preface, he has inserted a miscellaneous supplement of eighty pages, with notes and observations without number. In the last volume we find, also, another preface from his pen, with a multiplicity of notes dispersed throughout the text. In short, his task has been an arduous one. He has had to act many parts in this performance: 1st, as translator, in which capacity he has succeeded to the satisfaction of his associate; 2d, as amanuensis to Dr. Mott, in which he has also performed a useful part; 3d, as compiler and commentator, in which he has shown but little discretion, no system, and an insufficient acquaintance with surgery, to prevent him from mistaking trifles for affairs of moment. His fourth part has been that of panegyrist; here "Richard is himself again." We cannot repress the temptation of favouring our readers with one or two of his boldest strokes in this line.

"I feel constrained also to add, that the accomplishment of this part of my labour is one to which considerations of love of country add in my mind no slight degree of value. For young as our country is in history, and filled as its annals are with great names, both in the heroic period of its settlement, and in its sub-

sequent ages of military renown, national emancipation, and diffusion of the arts, there is in my humble judgment no name that adorns those annals either in the battle field, or in the councils of government, or in its diplomacy, that has added more sterling reputation and abiding lustre to the intrinsic glory and future fame of America than that of VALENTINE MOTT, unaided and ungilded though that name may be by the insignia of office or of power.

"For one who in his duties as a Christian and a man of science, has done so much personally in the active field of benevolence, and struck out such noble discoveries and new paths to enable us more effectually to alleviate the miseries of our fellow creatures, there will be a balm, as we believe, that will rest upon his memory in after time, less dazzling perhaps, but certainly full as enduring, and far more endearing to future generations, than any that the most ardent homage of patriotism could feel inspired with, for the glare of the most brilliant civic or military exploits."—(Vol. II. p. 5.)

A portion of the following will be found quite as characteristic as the foregoing:—

"To our countryman, Dr. Brashear, who was a pupil of the eminent Dr. Ridgeley, of the continental army of the Revolutionary war, and also a student at the University of Philadelphia, under Dr. Rush and other famous men of that day, are we indebted, as is now ascertained, for the *first* operation, or amputation of the thigh at the hip joint or *coxo femoral articulation* ever performed in America, and which was followed with complete success. This occurred as early as the year 1806, *only three years* after the illustrious Larrey had revived and perfected this operation in the campaigns of Napoleon. (See text of M. Velpeau on this subject, p. 637, &c. in Vol. II. of this work.)

"With that self-neglect of one's own rights, that is ever a prominent characteristic of the diffidence of men of genius, and from his having early in life withdrawn from active practice, Dr. Brashear had never published this case. Dr. Mott, therefore, as is seen in his case of coxo-femoral disarticulation in Vol. II. of this work, had hitherto supposed that he was the surgeon who in this country had first performed this important operation. With a magnanimity which ever belongs to him, and which we trust will serve as an emphatic lesson to those who in their malignity would rob and calumniate both the dead and the living, Dr. Mott cheerfully abstracts the plume from his own honoured brows, that can spare many and much more like this, and affixes it upon the name of the gentleman to whom it rightly belongs."—(Vol. III. p. iv.)

M. Velpeau's portion of the work before us, is already too well known to require of us either comment or analysis. Few books on operative surgery have ever acquired—none, perhaps, have ever deserved, a greater reputation, than the one upon which the present translation is founded. Without claiming to be complete in all its parts, and without assuming to assign the exact measure of credit to every individual among the host of contributors to the general advancement of modern surgery, it nevertheless comes as nearly up to this, as the extent and nature of the researches involved in the task, the French spirit of nationality, and M. Velpeau's rather prurient desire to stand forth as an extensive innovator and improver himself, could reasonably be expected to allow. His work is emphatically the great representative of the operative surgery of the present century, as that of Heister was of the century that is past. It will, probably, in future editions, be for the most part disencumbered from the incrustations of the present version; and once again restored to its fair proportions, it must continue, for time to come, to occupy its present position as a book of frequent reference.

We must now notice, as briefly as possible, the arrangement of the materials composing these volumes.

M. Velpeau has distributed his materials under four great divisions or

titles; the first, embracing operations in general; the second, minor surgery; the third, general operations, or such as apply to different parts of the body in common; the fourth, special operations, or such as apply only to particular regions or organs.

Title First, treats under distinct heads; 1, of classification; 2, the nature of operations; 3, the care required in these; 4, the conditions necessary to them; and 5, the consequences resulting from them.

Title Second, is divided into two parts; 1, dressing and bandaging, which is subdivided into eleven chapters; and 2, minor operations, which is again subdivided into six chapters.

Title Third, at which, properly speaking, the great business of operative surgery begins, is divided into two parts; the first, referring to elementary operations; and the second, to complex operations. This last, extending over the greater part of the whole work, is subdivided into twelve sections, occupying a good portion of the first, the whole of the second, and a part of the third volume.

The *first section* is occupied with operations upon the cuticular surface.

The *second* treats of operations for deformities, and is subdivided into five chapters:—1. Morbid cicatrices; 2. Subcutaneous bridles; 3. Deformities from contracted tendons and muscles; 4. Deformities from alterations in ligaments and aponeuroses; and 5. Deformities from alterations in the skeleton.

The *third* section is devoted to anaplasty, the details of which are scattered over twenty chapters.

The *fourth* opens with the second volume, and is occupied with operations upon the arteries in general. It is subdivided into three chapters:—1. Anatomical remarks; 2. Spontaneous termination of lesions of arteries; 3. Treatment of arterial lesions.

Section *fifth*, treats of operations on particular arteries, and is subdivided into four chapters.

Section *sixth*, operations upon the veins, is mainly devoted to the management of varices.

Section *seventh*, referring to operations on the lymphatics, is disposed of in a single paragraph.

Section *eighth*, operations on the nerves, is also a short section, and divided into two chapters:—1. Operations on the nerves of the head and neck; 2. On the nerves of the limbs.

Section *ninth*, treats of amputations, and is subdivided into part first, amputations in general; and part second, amputations in particular.

Section *tenth*, excision of bones, is divided into part first, excision in the continuity of bones; and part second, excision of the articulations.

Section *eleven*, trephining, treats in three chapters; 1, Of trephining the head; 2. The bones of the trunk; and 3. Those of the limbs.

Section *twelfth*, tumours, is very voluminous, and subdivided into thirteen chapters, which we need not stop to specify.

Title Fourth, on special operations, occupies the greater portion of the last volume. It is divided into nine parts, the most of which are again subdivided into chapters. *Part first*, treats of operations about the head and face. *Part second*, operations about the neck. The *third* treats of operations about the chest; the *fourth*, about the abdomen; the *fifth*, treats of hernia; the *sixth*, of operations for diseases of the genital organs; the *seventh*, of calculi; the *eighth*, of operations for diseases of the urethra; the *ninth*, of operations for diseases of the rectum.

With this general enumeration of subjects, we must, for the present, leave these volumes, and turn to those of Chelius; reserving what we have yet to offer in regard to the contents of the first of these works, until we are prepared to speak of them in connection with the contents of the second.

The manual of Professor Chelius has long been a favourite text-book of surgery in the German schools. It was first presented to the public in 1821. It has undergone six editions under the immediate supervision of its author; and, by the favour of translations, it has been the means of diffusing some general notion of German surgery, and of German surgical writers, throughout the rest of Europe.

It appears never to have been the design of Chelius to prepare a complete system of surgery; his object being, as he tells us in the preface to his first edition, to furnish for the use of his pupils, a short and clear description of surgical diseases, and of the modes of treating these, in connection with a well-arranged and thorough system of surgical bibliography. And although his work since its first appearance has undergone many modifications and improvements, in keeping with the progress of surgical knowledge, yet, up to the last edition of the original, we find it still preserving its primitive character as a manual. But in some of the translations, particularly in the French version by M. Pigne, and in the present English version by Mr. South, it has in some degree lost this character, and by their numerous comments and annotations, it has, at length, grown into a voluminous system.

M. Pigne, in his version of the fourth edition, has incorporated with the text much of the surgery of Dupuytren and of other masters of the French school, and the author himself, in his later editions, has adopted some part of these materials. Mr. South again, in his version of the sixth edition, has still further augmented the work with the results of his own extensive observation, with selections from the records of British Surgery, and with no small amount of useful and well-digested matter from the writers and practitioners of the present day, both of Great Britain and America. Insomuch that the work, as he has now presented it to us, might as well have been entitled "South's Commentaries on the Elements of Surgery," as a "System of Surgery," by Chelius himself.

It is not our purpose, after what we have already said, to express any opinion on the course which Mr. South has marked out for himself in thus materially altering the general scope and character of the original work. He must be the exponent of his own views on this point.

"Had I confined myself to a mere translation of my original, many important points must have been omitted, and the object for which I undertook the publication of the handbook could not have been attained. I was therefore obliged to resort to annotations and comments, the result of my own experience and reading, for the purpose of filling up and enlarging the author's short notices, so as to render them more generally useful both to the student and the practitioner. In doing this I have far exceeded the limits I had originally proposed to myself, but the subject is so important, and fresh matter was so constantly at hand, that my great difficulty has been in restricting my work within present bounds.

"I shall be charged, I fear, with having buried my author beneath a mass of notes and comments. They are indeed numerous, and they might occasionally have been made shorter, had I condensed, in my own words, the opinions of the authors I have cited. To this practice, however, though not uncommon, I am utterly opposed. The meaning of a writer ought to be best set forth in his own words, and if others attempt to convey his meaning briefly, they not unfrequently fail to declare his opinions, or they altogether misrepresent them. I have, there-

fore, with but few and unimportant exceptions, quoted the statements of authors in their original words. I have also, as far as possible, endeavoured to award to the originators of new modes of practice, their just meed of credit; and if, as may occasionally have happened, I have passed by unnoticed any of the leading surgical writers of the British schools, I hope on a future opportunity to repair my seeming inattention.—(Vol. I. pp. 9, 10.)

Before proceeding to a more intimate acquaintance with the contents of these volumes, it may be well to observe, that the principal text is regularly divided, for the sake of easy reference, as well as for the saving of words, into a series of distinctly numbered paragraphs; and that the less important notes and observations of the author, in common with the additional materials furnished by the translator, are appended to the paragraphs to which they respectively relate, and are printed in smaller type, so that the body of the work may be read either continuously, or in connection with the annotations, as may best serve the purpose of the early student, or that of the inquiring practitioner.

But the peculiar feature of this work, and that which adds most to its value as a book of reference, is its copious surgical bibliography. The author has placed at the head of every chapter and other subdivision, and elsewhere as occasion seemed to require, a list of the most important books that have been published upon the subject, giving not only the title and date of publication of such as he may himself have had occasion to consult, but also of such others as he had any knowledge of; so as to make his series of references as full as possible. Mr. South does not appear to have followed him very assiduously in this department of his labours. He has failed to mention some well-known British writers. But the American editor, Dr. Norris, has very judiciously in great part made up for this deficiency. For, without attempting further to encumber the work with additional annotations, he has supplied numerous references to such of the surgical writers of Great Britain and America, as appeared to him worthy of notice, and to have been overlooked by the author and translator.

Professor Chelius very justly observes, that the distinction between external and internal diseases which has been taken as the ground of difference between medicine and surgery, is entirely without meaning. He would attempt to discover some general characteristics of disease, upon which to found a nosological distinction between these two great branches of the healing art. In so doing, he would exclude from surgery the whole group of functional disorders; and include in it only *such of the organic diseases as have their seat in parts accessible to our organs of touch, or such as allow of the employment of mechanical means for their cure.*

We shall not stop to examine, very minutely, this new ground of difference between medicine and surgery. The author himself is not strenuous in his observance of it. He breaks through it, at the very onset, in treating of inflammation. But we may remark in passing, that it is scarcely more definite than the one which he repudiates; and it has the additional disadvantage of excluding from the province of surgery, certain diseases of a functional character, such as superficial neuralgias, spasmodic affections of the muscles, constitutional disturbances, originating in external diseases, and other affections, which, by common consent, are assigned to the surgeon. The author, indeed, does not neglect to notice the whole of these; but in following out his plan, he alludes to them, for the most part, only in an incidental manner, and not so directly as he might have done, had he not felt himself cramped by his attempt at arranging surgical diseases in accordance with what he considers their internal and actual agreement.

Surgical diseases, he observes, may depend, "1, *on the disturbance of organic connection;* 2, *on the unnatural union of parts;* 3, *on the presence of foreign bodies;* 4, *on the degeneration of organic parts, or on the production of new structures;* 5, *on the entire loss;* and 6, *on the superfluity of organic parts.*"

Starting with this view, as furnishing the fundamental ground for his nosological arrangement, and admitting inflammation, as it were by necessity, at the head of these, he arranges them under the eight following divisions, viz:

I. Division.—*Of inflammation.*

1. *Of inflammation in general.*
2. *Of some peculiar kinds of inflammation.*
   a. Of erysipelas; *b.* Of burns; *c.* Of frost-bite; *d.* Of boils; *e.* Of carbuncle.
3. *Of inflammation in some special organs.*
   a. Of inflammation of the tonsils; *b.* Of the parotid gland; *c.* Of the breasts; *d.* Of the urethra; *e.* Of the testicle; *f.* Of the muscles of the loins; *g.* Of the nail joints; *h.* Of the joints, viz.
   a. of the synovial membrane; b. of the cartilages; c. of the joint-ends of the bones, viz., *aa.* in the hip-joint; *bb.* in the shoulder-joint; *cc.* in the knee-joint; and so on.

II. Division.—*Diseases which consist in a disturbance of physical connection.*

I. *Fresh solutions of continuity.*
   A. Wounds; B. Fractures.
II. *Old solutions.*
   A. Which do not suppurate, viz.
      a. False joints; *b.* Hare-lip; *c.* Cleft in the soft palate; *d.* Old rupture of the female perineum.
   B. Which do suppurate, viz.
i. *Ulcers.*
   1. In general.
   2. In particular.
      a. Atonic; *b.* Scorbutic; *c.* Scrofulous; *d.* Gouty; *e.* Impetiginous; *f.* Venereal; *g.* Bony ulcers or caries.
ii. *Fistulas.*
   a. Salivary fistula; *b.* Biliary fistula; *c.* Fæcal fistula and artificial anus; *d.* Anal fistula; *e.* Urinary fistula.
III. *Solutions of continuity by changed position of parts.*
   1. Dislocations; 2. Ruptures; 3. Prolapses; 4. Distortions.
IV. *Solutions of continuity by unnatural distension.*
   1. In the arteries, aneurisms; 2. In the veins, varices; 3. In the capillary-vascular system, teleangiectasis.

III. Division.—*Diseases dependent on the unnatural adhesion of parts.*

1. Anchylosis of the joint-ends of bones; 2. Growing together and narrowing of the aperture of the nostrils; 3. Unnatural adhesion of the tongue; 4. Adhesion of the gums to the cheeks; 5. Narrowing of the œsophagus; 6. Closing and narrowing of the rectum; 7. Growing together and narrowing of the prepuce; 8. Narrowing and closing of the urethra; 9. Closing and narrowing of the vagina and of the mouth of the womb.

IV. Division.—*Foreign bodies.*

1. *Foreign bodies introduced externally into our organism.*
   a. into the nose; *b.* into the mouth; *c.* into the gullet and intestinal canal; *d.* into the wind-pipe.
2. *Foreign bodies formed in our organism by the retention of natural products.*
   A. Retentions in their proper cavities and receptacles.

a. Ranula; *b.* Retention of urine; *c.* Retention of the fœtus in the womb or in the cavity of the belly (Cæsarean operation, section of the pubic symphysis, section of the belly).

B. Extravasation external to the proper cavities or receptacles.

a. Blood swellings on the heads of new-born children; *b.* Hæmatocele; *c.* Collections of blood in joints.

3. *Foreign bodies resulting from the accumulation of unnatural secreted fluids.*

a. Lymphatic swellings; *b.* Dropsy of joints; *c.* Dropsy of the bursæ mucosæ; *d.* Water in the head, spina bifida; *e.* Water in the chest and empyema; *f.* Dropsy of the pericardium; *g.* Dropsy of the belly; *h.* Dropsy of the ovary; *i.* Hydrocele.

4. *Foreign bodies produced from the concretion of secreted fluids.*

V. Division.—*Diseases which consist in the degeneration of organic parts, or in the production of new structures.*

1. Enlargement of the tongue; 2. Bronchocele; 3. Enlarged clitoris; 4. Warts; 5. Bunions; 6. Horny growths; 7. Bony growths; 8. Fungus of the dura mater; 9. Fatty swellings; 10. Encysted swellings; 11. Cartilaginous bodies in joints; 12. Sarcoma; 13. Medullary fungus; 14. Polypus; 15. Cancer.

VI. Division.—*Loss of organic parts.*

1. *Organic replacement of already lost parts*, especially of the face, according to the Tagliacozian and Indian methods.
2. *Mechanical replacement:* Application of artificial limbs, and so on.

VII. Division.—*Superfluity of organic parts.*

VIII. Division.—*Display of the elementary management of surgical operations.*

General surgical operations: Bleeding, cupping, application of issues, introduction of setons, amputations, resections, and so on.—(Vol. I. pp. 16, 17.)

We shall not stop to criticise the foregoing classification. With some good features in its favour, it is, nevertheless, open to serious objections. But it has enabled the author to speak either directly or incidentally of almost every surgical disorder; and the inconveniences attending it are, in a great measure, obviated by a copious analytical index. It will be observed that our author nowhere treats of the diseases of the eye or ear. The omission is not an accidental one; but as these diseases have attained to great importance, he is disposed to think that they may be more conveniently spoken of apart, and assigned to special essayists.

Thas far, the introduction. The next, come some hasty notes on the history of surgery; after which, follows a list of about twelve pages of surgical authorities, in which we find enumerated most of the standard works in the several departments of surgical literature.

The first main division of the work opens at page 32, volume first; and as shown by the general arrangement of subjects above cited, it is devoted to the consideration of inflammation in general, to some of the special modifications of inflammation, and to some of its more important local manifestations. The second division opens at page 317, and, as above shown, it embraces a very extensive range of subjects. It occupies the remaining portion of the first volume, and the whole of the second volume of the present edition. The third division commences with the third volume, and occupies 92 pages. The fourth division, treating of foreign bodies, of retained secretions, &c., occupies the next 286 pages. The fifth, devoted to the consideration of hypertrophy, tumours, and other morbid growths, occupies nearly 200 pages. The sixth, on the loss of organic parts, occupies

only 20 pages. The seventh is summed up in two pages; while the eighth, or last, which is devoted to elementary surgical operations, and to the modes of operating for the cure of certain affections, not included in either of the foregoing divisions, occupies 170 pages. The index occupies the remaining 172 pages of this volume.

To enter into a minute examination of this vast amount of materials, or to analyze the 2856 distinct paragraphs, that constitute the body of the work, without speaking of the unnumbered and almost innumerable notes and comments that are appended to these, would carry us far beyond the limits of an ordinary review; nor is it necessary, in a treatise of this sort, that we should be thus minute in the exposition of its contents. It may suffice to refer to a few of the more prominent topics, to furnish a general view of the spirit and temper of the rest, to illustrate the author's, as well as the translator's, manner; and to offer a few passing criticisms on such points as may appear open to objection.

And first, of a form of disease which, to ourselves, appears somewhat new; and to which our author alludes, in connection with the products and results of inflammation, under the head of *lymphatic swellings*.

"Beinl, Rust, and others, consider the nature of the so-called lymph-swelling to be an *extravasation of lymph*, depending on a rupture of the lymph-vessels, or on an unnatural extension of their walls, and they explain the gradual sinking of the powers of the constitution and so on, which occur at the latter period of the disease, and after its bursting, by the continued loss of the lymph.* The observations made on the fluid contained in these swellings (which Rust imagined to be only in the earlier period of the disease, transparent and colourless) have shown that it has more of the properties of pus than of actual lymph, and Walther has decidedly proved that the acceptation of the term lymph-swellings in the sense just mentioned is inadmissible; that they must be considered only as abscesses (*lymph-abscesses*) preceded by a stealthy, if not a sensibly perceptible, inflammatory condition, which, however, on account of the too much depressed vital activity, could not produce a plastic consistent pus, but only a secretion of a thin more or less turbid lymphatic fluid. The opinion advanced by Beinl that the strongest and most healthy subjects are commonly more subject to this disease than the weakly, that men more than females, and that, without an external injury, a general diseased condition is incapable of producing a lymph-abscess, is incorrect, and has been disproved by Rust. How frequently, even by writers on lymph-swellings, cold-abscesses and such collections of pus as have formed at distant parts (*congestion-abscess*),† in consequence of carious destruction of the bones of the vertebral column, have been taken for lymph-swellings, and treated as such, I myself have frequently observed."—(Vol. I. pp. 60, 61.)

In commenting upon the foregoing paragraph, our author states, that—

"Nasse‡ describes a case in which a powerful healthy young man, in consequence of an external injury, had a swelling formed on the upper part of the thigh, the contents of which, after opening, perfectly resembled lymph. The pouring out of a clean transparent fluid could not be allayed by any treatment recommended for lymph-swellings, and the patient was exposed to the danger of hectic consumption. The local use of a solution of nitrate of mercury alone brought the lymph-vessels to close. This case (which I myself saw, although only once, in passing through Halle, and convinced myself of the continued outflowing of clear lymph which could be increased by pressure) proves that a col-

* J. A. Schmidt, über den Grund der Todtlichkeit de Lymphgeschwülste; in Abhandlungen der Medic. Chirurg. Jos. Akademie in Wien, vol. ii.

† A. Pauli, Bemerkungen über Congestions abscesse; in Rust's Magazin, vol. vii. p. 383; vol. viii. p. 434.

‡ Archiv für medicinische Erfahrung von Horn, Nasse, und Henke, vol. i. 1817, p. 377.

lection of lymph in the cellular tissue is possible, as the consequence of an actual tearing of lymph-vessels by external violence, the exudation from which ceases only by obliteration of the torn vessels. Cases of this kind are, however, undoubtedly very rare; to them alone can be applied the term *lymph-swelling* in its proper sense, and therefore the above advanced opinion, '*that the cases commonly spoken of as lymph-swellings are merely modifications of abscesses,*' is rather confirmed than contradicted."—(Vol. i. p. 61.)

To this Mr. South appends the details of a case which occurred to him in 1839, and was entered in the books of St. Thomas's Hospital as a "Collection of synovial fluid within the femoral sheath," but which, to use his own words, "seems to be more nearly allied to the lymph-abscess of this paragraph, of which I was then ignorant, than to a collection of synovia, as I thought it perhaps might be." The case itself is too long to be quoted.

Mortification.—At paragraph 25, our author specifies various circumstances that may give rise to mortification. To these the translator appends several others on the authority of Brodie, Travers, &c.; and cites some observations of his own, of which the following are, perhaps, the most worthy of notice.

"Mortification occasionally happens in simple fracture, from slow but continued effusion, and without wound of the principal artery or arteries of the limb. I have seen this once in a flour-porter, whose leg was broken by being jammed with a cart-wheel; his constitution speedily took the alarm, and, though incisions were made through the skin to relieve the tension, he gradually became worse, and sunk into hectic, in which state his limb was removed; but he died a few hours after. Although from the first no pulsation could be felt in the tibial arteries, yet the examination after death showed them uninjured and undiminished in size.

Mortification I have also seen in one or two instances occurring from splints having been applied previous to the substance of the swelling after fracture, and not proportionally loosened as the swelling increased."—(Vol. i. p. 69.)

The truth of the foregoing remarks we could verify by cases that have fallen under our own eye; and we may further add, that local injuries occasionally give rise to mortification in a way not mentioned either by Chelius or his translator. We have known instances in which an external injury, without leading to an abrasion of integument, or to rupture of any organ, has suddenly and completely arrested the current of circulation through the principal vessel of a limb; the vessel from some cause or other being at once blocked up by the coagulation of the blood within it. The sudden arrest of circulation in this way is uncommon, but may be now and then seen in limbs that have been subjected to great physical violence. A slight blow over the immediate course of an artery, without leading to any rupture of the vessel whatsoever, will occasionally produce it.

Loss of Isochronism in the Arterial Pulsations of Different Vessels in connection with Mortification, &c.—In commenting on arteritis as one of the causes of mortification, Mr. South alludes to the case of a young man labouring under inflammation of the left brachial artery, which presents one feature not frequently noticed, and upon which, though Mr. S. does not dwell upon it, we wish to make a passing observation.

"*Aug.* 9, *A. M.* Whilst putting on his waistcoat, he was struck with pain like the prick of a pin, about the middle of the left upper arm, and in the track of the brachial artery, which continued for about an hour, and during that time his arm 'became dull and cold as low as the elbow.' He saw his medical attendant at 10 A. M.; the arm and hand were then cold, and no pulsation could be felt below the arm-pit, at which part the artery was felt beating, but not forcibly, (90 a minute,) and over it great tenderness on pressure. The pulse of the right wrist

was 100, and rather more powerful than usual. The ailing arm was ordered to be put in warm water for a quarter of an hour."—(Vol. i. p. 90.)

So far as we now remember, Abernethy was the first to notice that the pulsations in different vessels of the body, as in the example just given, are occasionally found not to correspond in time or frequency. We have ourselves observed this want of isochronism in three instances; once in the posterior tibial artery, in a case of gangrene of the great toe depending on circumscribed inflammation in the upper part of the femoral artery; once in the vessels at the wrist, in a case of gangrene of a finger connected with inflammation and partial obstruction in the upper part of the brachial artery; and once again in the posterior tibial, some days after a ligature had been applied to the femoral artery. Our observations on these several cases, were carefully made, and in the first and last case, several times repeated, so as to leave on our own mind no doubt of their accuracy.

Amputation for the Arrest of Gangrene.—At paragraph 74 we find Chelius and his translator at issue on the question of amputating in certain cases of gangrene. According to Chelius, if gangrene be produced by external violence, or if the cause of it can be removed in the removal of the gangrenous part, amputation may become necessary, even though the disease be still disposed to spread; and the operation performed under these circumstances, may be the means of preserving the patient's life. Mr. South, on the other hand, would, under no circumstances, resort to amputation while the gangrene is spreading. "For," says he, "the same action will be set up in the stump, and the patient's condition rendered worse by the shock of the operation. Only when the gangrene is proved to have stopped by the line of separation having descended to some depth in the soft parts, is amputation to be entertained."

As a general rule, no doubt, the course advised by Mr. South is the safest; as it is the one most commonly adopted. Nor would Prof. Chelius venture from it rashly. We must allow him to describe his own mode of proceeding.

"In most cases nature, after the gangrene is defined, throws off the gangrenous part, and *amputation is not required.* Amputation *is not applicable* in gangrene depending on an internal cause which is still in operation; for, in such case, after the performance of amputation, gangrene again takes place in the wound. But when the gangrene has effected the whole thickness of a limb, and is defined, and the separation of the dead part cannot be expected; or, when produced by external violence, it is proceeding, but the cause of the gangrene can be removed with the gangrenous part, amputation is to be considered as necessary and likely to save life. It is, however, here to be borne in mind that gangrene in the deeper parts commonly makes further progress than the external appearance indicates. The amputation must always be performed in the healthy part."—(Vol. i. p. 111.)

For ourselves, we must agree with Chelius, that, under certain circumstances, amputation should be advised while the gangrene is yet undefined by any line of demarkation; and on turning to M. Velpeau, we find him of the same opinion. In regard to the practice long since established by Pott and Sharp, of amputating only after the gangrene has been definitely checked, M. Velpeau remarks, "This manner of viewing the subject, based as it is upon an accurate observation of facts, should be adopted as a general, but not as an absolute rule." The circumstances under which such a procedure would be proper, imply, of course, local injury so severe as to lead to a fatal issue if the patient be left to the efforts of nature alone; secondly, freedom from internal organic disease that can in any way be

associated with the occurrence of the gangrene, and a manifest cause for the latter that can either be removed with it, or attributed wholly to external influences.

Within the past two years, although strenously opposed in consultation with surgeons of experience, we have, in two instances, resorted to amputation in cases of traumatic gangrene. In both, the gangrene was the result of overwhelming injury; one from the bursting, the other from the accidental discharge of a cannon. In both, amputation was performed at an interval of some days after the accident, and while the gangrene was in progress. In one, the amputation was performed above the knee, and the patient recovered without an untoward symptom; in the other the arm was removed at the shoulder-joint, the gangrene was arrested by the operation, and the stump took on a healing action, but tetanus supervened and terminated fatally on the twelfth day.

Erysipelas.—The second section of the first division of Chelius's book opens with the consideration of erysipelas, which he treats of under two heads, the true and the false; the one depending on previous vitiation of the general health; the other occurring without any previous constitutional disturbance, and mostly from external irritation. The following is his account of the true erysipelas.

"The *true erysipelas* appears without any local disposition to disease, but with previous general indisposition, which is usually shown by weakness and heaviness of the limbs, listlessness, pain in the region of the stomach, loaded tongue, nasty taste in the mouth, disposition to vomit, more or less active fever, headache, wandering, lethargy, or madness,—as a pale uncircumscribed redness of the skin, fading into yellowish, which spreads unequally, is shaded off towards the edge, disappears on pressure with the finger, but returns when the pressure is removed. After the appearance of the erysipelas the fever generally diminishes or disappears; but every fresh attack is accompanied with fever. The seat of this erysipelas never extends beyond the lymphatic-vascular net overspreading the surface of the cutis. The severity of the disease is as various as is the condition of the part first attacked; it, however, usually subsides under critical discharges of perspiration and urine, and with scaling of the skin; it never runs into suppuration, but only, with weakly constitutions and other concurrent circumstances, into ulceration and gangrene, in consequence of which the destruction of the surface of the body extends to the parts beneath, and there ensues, not a bounded fluctuating abscess, but an open, wide-spreading, putrid, ulcerating surface. If the scaling of the skin, critically following the erysipelas, be disturbed by moist remedies, by cold and so on, dropsical swelling ensues. This erysipelas is very fugitive; it subsides of itself; but more commonly after the external use of moist remedies, of cold, or on mental emotions, and so on, it suddenly quits the surface, and causes inflammation of the brain, chest, or belly, madness, convulsions, paralysis, and so on. The true causes of this erysipelas are biliary irritation, disturbance of the functions of the liver, collections of gastric impurities, use of indigestible food, obstruction in the portal system, and a prevalence of peculiar atmosphere and temperature, in consequence of which it seems to be commonly epidemic, especially towards autumn and during summer."—(Vol. i. pp. 115, 116.)

He further speaks, in the note following the foregoing description, of vesicular and bullar erysipelas, as a variety of the true form.

Mr. South questions the propriety of applying the term erysipelas to the disease described under that name by Chelius. We need not cite his own words. He attempts, after the manner of the dermatologists, to point out the distinction between erysipelas and erythema, as drawn merely from external appearances; and, to us at least, his remarks appear somewhat bookish and hypercritical. The author's account of the disease, however, might have extended, with advantage, to the modification of its symptoms

and effects resulting from the parts affected. We see no special notice of erysipelas of the head and face; of erysipelas as it is reflected along the mucous surfaces, leading, as it occasionally does, to angina; and causing death, as we have more than once observed, by suffocation from œdema of the glottis. The erysipelas of hospitals, and the modes of preventing it; and the association and frequent alternation of erysipelas with peritoneal inflammation and typhus fever; might also have been noticed as occurring without any actual recession of the external efflorescence.

The inflammation of the brain, of which Chelius speaks as resulting from the recession of erysipelas, is perhaps less frequently identified by post-mortem inspection than severe congestion of that viscus—an alarming complication, which may be sometimes instantaneously removed by vesicating the scalp with concentrated aqua ammoniæ. Chelius does not include phlegmonous erysipelas in his description of the true, and he cannot apply to it his description of the spurious form of the disease. But to this point we find the translator has alluded in his notes upon the text, as well indeed as the author himself, under the head of metastatic abscess. The course of treatment, internal as well as local, pointed out by Chelius and his commentator, corresponds closely with that commonly laid down by the best of our surgical writers. We need not, therefore, more particularly refer to it. M. Velpeau, on the other hand, has a favourite treatment of his own for this affection, an account of which Dr. Townsend has given us among his notes to the first volume of the Operative Surgery.

M. Velpeau, he tells us, has treated one thousand cases, and has taken minutes of four hundred; and yet, up to the present time, *his experience extends only to external remedies.* Among these he has experimented with compression, blistering, nitrate of silver, mercurial ointment, hog's lard, white precipitate ointment, sulphuric acid, hydro-chloric, citric, tartaric, and dilute acetous acid; common salt and water, liquid nitrate of mercury, camphor, and bird-peck punctures, and all to no purpose. "Professor Velpeau had in despair renounced all the above remedies," when "his attention was drawn to the changes effected upon the blood by the preparations of iron." "Impressed with the idea that the inflamed tissues in erysipelas are impregnated with blood and altered fluids, he asked himself the question, if *ferruginous* applications might not have some efficacy upon a disease so superficially situated?" He settled upon a formula of *sulphate of iron*, in solution, nine drachms to forty ounces of water; or, in the form of ointment, eight parts of the salt to thirty of lard. The new remedy was employed in forty cases, with something like encouraging results, which we need not particularize.

"Unless, therefore, says M. Velpeau, numerous and remarkable coincidences have on this occasion deceived me, as so often happens to others, there is good reason to believe in the efficacy of sulphate of iron as a topical application in erysipelas. In *no* case did the inflamed surface resist this means over twenty-four to forty-eight hours. It is only strange that the spreading (*ambulant*) erysipelas, extinguished at the point of its origin, continued, nevertheless, under this treatment to develop itself, even upon regions already covered and wet (*enduites et imbibées*) with the preparation of iron. Can it be that this remedy, like so many others, may be curative but not preventive? Is it necessary, in order that the inflammation should be modified, that it should be completely established?"

"The researches I am continuing to make will, perhaps, enlighten us on this subject."—(Vol. i. p. 71.)

We shall not attempt to comment upon the foregoing, further than to notice the acknowledgment, that M. Velpeau has no experience of the use

of internal remedies in the treatment of erysipelas; a singular announcement, certainly, that he should allow a thousand cases of this disease to pass through his hands without even attempting to employ the means upon which most other surgeons place their principal reliance. In justice to M. V., however, we must remark, that the foregoing facts constitute no portion of his operative surgery, and may have been incorporated with his book without due consideration.

Hemorrhage Incidental to Operations on the Tonsils.—Chelius, in the third section of his first division, among other forms of local inflammation, treats of tonsillitis, chronic enlargement, abscess, and gangrene of the tonsils. We shall not follow him in his account of these. But we cannot pass over Mr. South's Notes, on the dangers incidental to puncturing, scarifying and excising the tonsils. They may serve as a caution to many who are yet anxious for the first opportunity of trying their shaving machines upon these organs, too often the mark for beginners. First, *of scarifications:*

"In scarifying the tonsils, there is danger of wounding the carotid artery, or some branch, which will continue bleeding and cause serious alarm. Watson mentions in his Lectures a case of fatal bleeding from wound of the internal carotid artery:—'Only a very few years ago, in Ireland, it was struck by a surgeon while scarifying a gentleman's tonsil, and he died in three minutes.' In another case, which occurred under Watson's own care in 1838, in which the tonsil glands, during convalescence from scarlet fever, having become so enlarged as to impede breathing considerably, 'the surgeon in attendance punctured the tonsils. The next day a good deal of hemorrhage took place; and this recurred several times, to a considerable and even alarming amount. When the clots that formed were wiped away with a sponge, the blood could be seen welling out in a little stream, with a pulsating motion, from a small incision in the left tonsil. The hemorrhage was ultimately, after much trouble and anxiety, arrested by applying a pencil of lunar caustic freely within the bleeding orifice." (p. 792.)—(Vol. i. p. 160.)

Second, *of Puncture:*

"Portal (*Cours d'Anatomie Médicale*, vol. v.) mentions a case in which, in performing this operation with a pharyngotome, "a dexterous surgeon of Montpellier had the misfortune to open a large artery, and see the patient perish of so severe a hemorrhage that nothing could arrest it." (p. 509.) Allan Burns also says:—'In this country, (Scotland,) I have been informed that a surgeon, in opening a tonsillitic abscess, actually did plunge the knife into the carotid. I need hardly add that he lost his patient before he could suppress the bleeding.' (p. 256.) My late colleague Tyrrell was accustomed to mention, in his Surgical Lectures, a case to which he was fetched by a practitioner, who, having punctured an abscess in the tonsil gland, the wound was immediately followed by severe bleeding, and the patient was dead before he could reach the house. Sir Benjamin Brodie informs me that he is cognizant of two cases in which death from bleeding ensued after the puncture of tonsillar abscess.

"From the puncture of an immature tonsillar abscess, alarming hemorrhage may occur, without, however, destroying life; for the following instance of which I am indebted to my friend Lawrence:—

Case.—"'In a gentleman labouring under *cynanche tonsillaris*, a premature puncture was made, with the expectation of evacuating matter. A most profuse bleeding ensued, which stopped from the occurrence of fainting, and did not recur. It, however, not only seriously alarmed the patient and those around him, but also the gentleman who made the puncture. A long time elapsed before the patient recovered his strength.'"—(Vol. i. p. 162.)

Third, *of Excision.*—The large vessels in the neighbourhood of the tonsil are not often wounded in this operation, and yet it occasionally gives rise to fearful bleeding. We are aware of one instance, in which a clergyman

nearly bled to death after the removal of a tonsil by means of one of the fashionable tonsil cutters. "Of wound of the carotid artery in removing the tonsil gland," says Mr. South, "I have not met with, nor heard of a single instance."

"But their removal is sometimes attended with very fearful hemorrhage. My friend Callaway informs me, that he has 'seen sometimes considerable, and, in one case where he had removed the tonsil by the knife, alarming hemorrhage in a boy of seven years of age, which required stimuli, &c., to recover him from the fainting which followed.' I have to thank my friend Shaw for the following

"CASE.—A man aged forty years was deaf in the left ear, and the tonsil on that side being enlarged, it was excised with the guillotine on *Saturday*. No bleeding of consequence followed, the gland being hard and light-coloured, as if of old standing. On *Monday* he complained of sore throat, and the incised surface appeared as if a superficial slough were about to form. On the afternoon of *Tuesday* bleeding commenced in the lower part of the cut surface where ulceration had taken place adjoining the slough. An oozing of blood, varying in quantity, continued, in spite of repeated attempts to check it with styptics, till the afternoon of *Thursday*, when he was so much exhausted that the carotid artery was tied. The bleeding now ceased completely; the wound rapidly closed, and the ligature came away on the twelfth day; in a short time after he was discharged cured."—(Vol. i. p. 166.)

Time for Opening Abscess of the Breast.—Inflammation, leading to abscess of the female breast, according to Chelius, may occur either during nursing or after that period; and may be situated "either in the *skin and cellular tissue alone* or *in the parenchyma of the gland itself*." To which he might have added, that large abscesses are occasionally met with in the breasts of young women before marriage; and may be situated as above stated, or lie between the gland and the surface of the pectoralis major muscle beneath it. In the treatment of such abscesses we find Chelius and Mr. South again at issue. According to Chelius, "If the inflammation pass into suppuration, the softening poultices must be continued, cicuta and mercurial plaster applied, and the *opening of the abscess left to nature*." This latter part of his advice is rather heterodox among the surgical authors of the present age at least; and, on this point, we have no hesitation in siding with Mr. South, who states that "the abscess is *always to be punctured freely as soon as fluctuation can be distinctly felt*, and whilst the walls of the abscess are still thick." His reasons for this course are numerous and satisfactory; but in these we need not follow him.

Gonorrhœa.—This disease Chelius speaks of in his section on Local Inflammations; and here we meet with one of the striking inconveniences of his artificial arrangement of subjects. He is forced to separate gonorrhœa proper from most of its concomitants and consequences. Syphilis, or rather syphilitic ulcers, are spoken of in another division of the book; disease of the testicles depending on the one or the other of these, out of this connection; and strictures and their consequences are separated from each other, as well as from the primary diseases that give rise to them. As to the *nature* of gonorrhœa, and its connection with the venereal disease, he lays down the following distinctions:

"1. Gonorrhœa *arising without infection from external injury*, for instance, hard riding, blows upon the urethra, onanism, two frequent connection, introduction of foreign bodies into the urethra and so on; or *from internal disturbance*, as herpetic, or gouty humours, repelled eruptions, suppressed secretions and so on.

"2. Gonorrhœa *depending on peculiar contagious* matter, the influence of which, however, does not spread beyond the urethra.

"3. Gonorrhœa *which has a venereal origin*, rather as a consequence of general

venereal disease, or as a primary syphilitic affection with or without ulceration. This kind of gonorrhœa may pass into general venereal disease."—(Vol. i. p. 182.)

Our author enters at some length into the history of this affection; and Mr. South's additions on this point are also quite extensive. We shall notice only one of his remarks. "In deciding upon the cure of gleet," says he, "let it never be forgotten that so long as only six or eight drops of the discharge are observed during the day, or even if the lips of the urethra be merely moist with it on rising in the morning, the cure is not affected, and the person ought not to marry, or he will infect his wife."

Syphilitic Inflammation of the Testicle.—In enumerating the several causes that give rise to inflammation of the testicle, Chelius admits, in common with most others who have of late written on the venereal diseases, that "it may be a symptom of general syphilis." Mr. South, after referring to Hunter and Astley Cooper as siding with Chelius in his opinion, as he might have done to several others who have made the various forms of syphilis their special study, states, at length, that "notwithstanding these high authorities, I must confess I have great doubt as to the swelling of the testicle depending on a syphilitic cause." As to ourselves we have no such doubts whatever. But we have serious doubts in admitting as proved, a proposition assumed by Mr. South, on the strength of a case which is too long for us to quote, viz., the metastasis of gonorrhœa, and of gonorrhœal inflammation of the testicle to the brain. See his case, vol. i. page 206.

Inflammation of the Joints.—The concluding chapter of the first division of the work of Chelius, occupying about eighty-four pages, treats of inflammation of the joints; and, as here enriched by Mr. South's very copious notes, it constitutes one of the most valuable and useful chapters in the whole work. It is sub-divided into two parts; the first treating of inflammation of the several tissues entering into the structure of joints in general, as of the ligaments, synovial membrane, cartilages, and bones; and the second treating of the different forms of inflammation in particular joints. Mr. South has entered very fully into the healthy and morbid anatomy of the synovial membranes and articular cartilages, giving all the recent investigations by the microscope and otherwise, with running notes on the views and opinions of the best practical writers on the joints. Without attempting to analyze the contents of this chapter, we must commend it to the careful examination of our readers. We must make room, however, for a part of what is said of

Inflammation external to the capsular ligament of joints,—a form of disease frequently mistaken and treated for a more serious affection, even to the sacrifice of the limb. We have ourselves met with several cases in which we have confounded, for a time, disease in the cellular membrane about the joints, with inflammation beneath the capsular ligament; and have known extensive superficial abscesses mistaken for ulceration and exposure of the articular surfaces. We quote from Mr. South:

"The disease of the cellular membrane appears in two forms: 'the one in which a single, or more spots may have been the seat of the inflammation, having its origin from some injury which the part may have received, and pursuing a chronic course to the formation of small sacs of pus in those situations, which, perhaps, ulcerate through the synovial membrane; the second case is that in which the whole of the cellular membrane, surrounding the articulation, becomes inflamed, and ultimately envelops the joint in one large abscess. The first case is the more common of the two; the latter the effect of a sudden attack of inflammation, and more active in its course.'

"In 1839, I amputated the knee of a man, aged twenty-seven years, for disease of the former kind, which had resulted from slipping down stairs and bending his knee under him sixteen months before. The examination of the joint presented a large abscess on the inner condyle of the thigh-bone, which it had flattened and somewhat roughened without laying it bare; another long abscess extending from the knee upwards behind the hamstring, and downward, about three inches, below the head of the fibula; the skin over both abscesses very thin, but neither communicating with the other, nor with an open wound upon the outer condyle, the remains of an abscess which had burst five weeks before the operation. Behind the knee, in the popliteal space, was a fourth abscess, large and deep. Neither of the four had any communication with the cavity of the knee-joint, which did not contain any pus, but the synovial membrane, around the knee-cap, was thickened, soft, and jelly-like.

"Earlier in the same year I saw a case of the latter kind in a woman who, about a month previous, had received a blow on the inside of the knee; a fortnight after, she was attacked with severe shivering, which was followed by much swelling and puffiness about the joint, especially on the inside. A puncture was made just below the knee-cap, and twelve ounces of good pus discharged, but it was requisite to make a second opening two days after, and eight ounces more passed out. She did well. In a second case, where I had been attending a lady for many months, with what seemed to me chronic inflammation of the synovial membrane, with large effusion in the cavity of the joint; suppuration occurred some time after, whilst she was in Barbadoes; the abscess was opened, and she did well. Both these cases I, at the time, considered connected with the joint; but the result proved that such could not have been the case."—(Vol. i. pp. 234, 235.)

Wounds.—The second main division of Chelius' work commences with the consideration of wounds. These are spoken of under—1. Wounds in general; 2. Wounds in Particular Parts. This section is one of great extent, occupying about 226 pages; but we find, though the whole subject is well handled by the author and annotator, only a very few points calling for any special attention. In this section we meet with almost the only evidences we have met with in the whole work, of slight inattention on the part of the translator, in referring to authorities. Thus, he speaks of Belloq's well known instrument for plugging the posterior nares, as "a clever French instrument, whose inventor I do not know, which I brought many years since from Paris;" and he has allowed the name of his own countryman, Bromfeild, the inventor of the tenaculum, to stand Brownfield, as it may have, perchance, been erroneously misspelt by the author; but which is not so misspelt in his fourth edition, the only one to which we have access. In mentioning these oversights, we may also allude to another, vol. iii. pp. 100, 101, common to both author and translator, in coupling the names of Verduc and Guattani, as if the two belonged to one individual. We may notice in connection with wounds: first, some of the author's observations on the

Modes of Arresting Hemorrhage.—"The means by which bleeding may be staunched," says he, "are the *compression*, *ligature*, and *torsion* of arteries; *styptic astringent* remedies; and *cauterization*." He might have added to these, *elevated position* of the part from which the hemorrhage is proceeding, *nauseating remedies* internally, *derivative* and *revulsive applications* to parts remote from the seat of hemorrhage, and perhaps some one or two other expedients that are now and then of service.

Compression, he speaks of, at some length, under the heads of mediate and immediate: among the first of these, he speaks of pressing the vessel on the cardiac side of the injury, either with the fingers, the tourniquet, special compresses, graduated compresses, and slightly drawn bandages.

Among the second, he speaks of placing rolls of charpie, or pieces of agaric, sprinkled or moistened with styptics, over the mouth of the bleeding vessel, and securing these tightly with a suitable bandage. It will be seen that he here makes no mention of "compressed sponge," an article which some of our older surgeons were fond of recommending. Chelius very naturally leaves to the good sense of his readers and pupils to determine for themsevles what sort of material their graduated compresses should be made of; and, in so doing, he has left open to Dr. Mott an avenue to some little notoriety in his "somewhat novel" discovery, that it may be made of compressed sponge. We must allow Dr. Townsend to explain:

"Dr. Mott believes he has seen an instance lately, in which the subclavian artery, without the scaleni muscles, may have been wounded during an operation for the removal of a small tumour above the clavicle. The wound was probably of the nature of a *small flap* on its superior surface, between the first rib and the scalenus anticus muscle. In fact, the artery was perhaps nicked in this part, as a terrific hemorrhage ensued. In this dilemma, Dr. Mott, being sent for, adopted instantly a treatment somewhat novel, but which proved eminently successful, and went to corroborate his suggestion that it was the subclavian which was wounded.

"The practice consisted in the immediate application of a *small portion* of compressed sponge upon the bleeding part, which was situated at nearly the depth of the forefinger. This was followed successively by other small portions of sponge, until the wound was entirely and *compactly* filled up. An entire flat piece of sponge, just the size of the external opening of the wound, was now nicely adjusted over the ten or dozen smaller pieces which had been previously impacted. Finally, a larger flat piece of sponge, of still greater dimensions than the last, was now used to cover the whole mass, and to extend some distance on every side beyond the margin of the wound.

"Pressure with the hand was then made, by a succession of assistants, unremittingly for three days and three nights. After this, the pressure was confided to adhesive straps and a bandage, until suppuration made it proper to commence the removal of the sponges. This was done from day to day, with the utmost care, and by taking away piece after piece, without the least violence, until the last was separated, which was finally effected at the expiration of a week from the time that this surgeon commenced with their removal. The wound then granulated, and healed beautifully."—(Vol. ii. pp. 30, 31.)

The statements above set forth, if nothing further had been known either in regard to the case in which the sponge was employed, or in regard to sponge itself, might redound, in some measure, to Dr. Mott's credit for invention; but, as the facts have been elsewhere set forth, (see the *New York Journal of Medicine*, for March, 1846, pp. 242, 244,) it appears that there was not the slightest evidence that the subclavian artery had been injured; that the compress never for an instant checked the artery at the wrist; that the wound never cicatrized; and the case terminated fatally, by erysipelas. The colour given to the case by Dr. Mott, has been the means of inflicting serious injury on the fair fame of a most worthy surgeon, not unknown to the profession at large, and who had good reason to look for better treatment.

Ligature.—Chelius, at paragraph 291, describes his mode of securing a divided artery, as follows:

"In tying arteries the surgeon must endeavour, as much as possible, to include none of the neighbouring parts in the ligature, and still not completely to isolate the artery. He seizes the mouth of the wounded vessel with the forceps, by laying the points of the instrument on each side of it, and gently drawing it forwards. An assistant carries a round, not very thick, but sufficiently strong, waxed silk ligature, about the vessel, ties a single knot, and, whilst he holds the ends of

"In 1839, I amputated the knee of a man, aged twenty-seven years, for disease of the former kind, which had resulted from slipping down stairs and bending his knee under him sixteen months before. The examination of the joint presented a large abscess on the inner condyle of the thigh-bone, which it had flattened and somewhat roughened without laying it bare; another long abscess extending from the knee upwards behind the hamstring, and downward, about three inches, below the head of the fibula; the skin over both abscesses very thin, but neither communicating with the other, nor with an open wound upon the outer condyle, the remains of an abscess which had burst five weeks before the operation. Behind the knee, in the popliteal space, was a fourth abscess, large and deep. Neither of the four had any communication with the cavity of the knee-joint, which did not contain any pus, but the synovial membrane, around the knee-cap, was thickened, soft, and jelly-like.

"Earlier in the same year I saw a case of the latter kind in a woman who, about a month previous, had received a blow on the inside of the knee; a fortnight after, she was attacked with severe shivering, which was followed by much swelling and puffiness about the joint, especially on the inside. A puncture was made just below the knee-cap, and twelve ounces of good pus discharged, but it was requisite to make a second opening two days after, and eight ounces more passed out. She did well. In a second case, where I had been attending a lady for many months, with what seemed to me chronic inflammation of the synovial membrane, with large effusion in the cavity of the joint; suppuration occurred some time after, whilst she was in Barbadoes; the abscess was opened, and she did well. Both these cases I, at the time, considered connected with the joint; but the result proved that such could not have been the case."—(Vol. i. pp. 234, 235.)

Wounds.—The second main division of Chelius' work commences with the consideration of wounds. These are spoken of under—1. Wounds in general; 2. Wounds in Particular Parts. This section is one of great extent, occupying about 226 pages; but we find, though the whole subject is well handled by the author and annotator, only a very few points calling for any special attention. In this section we meet with almost the only evidences we have met with in the whole work, of slight inattention on the part of the translator, in referring to authorities. Thus, he speaks of Belloq's well known instrument for plugging the posterior nares, as "a clever French instrument, whose inventor I do not know, which I brought many years since from Paris;" and he has allowed the name of his own countryman, Bromfeild, the inventor of the tenaculum, to stand Brownfield, as it may have, perchance, been erroneously misspelt by the author; but which is not so misspelt in his fourth edition, the only one to which we have access. In mentioning these oversights, we may also allude to another, vol. iii. pp. 100, 101, common to both author and translator, in coupling the names of Verduc and Guattani, as if the two belonged to one individual. We may notice in connection with wounds: first, some of the author's observations on the

Modes of Arresting Hemorrhage.—"The means by which bleeding may be staunched," says he, "are the *compression*, *ligature*, and *torsion* of arteries; *styptic astringent* remedies; and *cauterization*." He might have added to these, *elevated position* of the part from which the hemorrhage is proceeding, *nauseating remedies* internally, *derivative* and *revulsive applications* to parts remote from the seat of hemorrhage, and perhaps some one or two other expedients that are now and then of service.

Compression, he speaks of, at some length, under the heads of mediate and immediate: among the first of these, he speaks of pressing the vessel on the cardiac side of the injury, either with the fingers, the tourniquet, special compresses, graduated compresses, and slightly drawn bandages.

Among the second, he speaks of placing rolls of charpie, or pieces of agaric, sprinkled or moistened with styptics, over the mouth of the bleeding vessel, and securing these tightly with a suitable bandage. It will be seen that he here makes no mention of "compressed sponge," an article which some of our older surgeons were fond of recommending. Chelius very naturally leaves to the good sense of his readers and pupils to determine for themsevles what sort of material their graduated compresses should be made of; and, in so doing, he has left open to Dr. Mott an avenue to some little notoriety in his "somewhat novel" discovery, that it may be made of compressed sponge. We must allow Dr. Townsend to explain:

"Dr. Mott believes he has seen an instance lately, in which the subclavian artery, without the scaleni muscles, may have been wounded during an operation for the removal of a small tumour above the clavicle. The wound was probably of the nature of a *small flap* on its superior surface, between the first rib and the scalenus anticus muscle. In fact, the artery was perhaps nicked in this part, as a terrific hemorrhage ensued. In this dilemma, Dr. Mott, being sent for, adopted instantly a treatment somewhat novel, but which proved eminently successful, and went to corroborate his suggestion that it was the subclavian which was wounded.

"The practice consisted in the immediate application of a *small portion* of compressed sponge upon the bleeding part, which was situated at nearly the depth of the forefinger. This was followed successively by other small portions of sponge, until the wound was entirely and *compactly* filled up. An entire flat piece of sponge, just the size of the external opening of the wound, was now nicely adjusted over the ten or dozen smaller pieces which had been previously impacted. Finally, a larger flat piece of sponge, of still greater dimensions than the last, was now used to cover the whole mass, and to extend some distance on every side beyond the margin of the wound.

"Pressure with the hand was then made, by a succession of assistants, unremittingly for three days and three nights. After this, the pressure was confided to adhesive straps and a bandage, until suppuration made it proper to commence the removal of the sponges. This was done from day to day, with the utmost care, and by taking away piece after piece, without the least violence, until the last was separated, which was finally effected at the expiration of a week from the time that this surgeon commenced with their removal. The wound then granulated, and healed beautifully."—(Vol. ii. pp. 30, 31.)

The statements above set forth, if nothing further had been known either in regard to the case in which the sponge was employed, or in regard to sponge itself, might redound, in some measure, to Dr. Mott's credit for invention; but, as the facts have been elsewhere set forth, (see the *New York Journal of Medicine*, for March, 1846, pp. 242, 244,) it appears that there was not the slightest evidence that the subclavian artery had been injured; that the compress never for an instant checked the artery at the wrist; that the wound never cicatrized; and the case terminated fatally, by erysipelas. The colour given to the case by Dr. Mott, has been the means of inflicting serious injury on the fair fame of a most worthy surgeon, not unknown to the profession at large, and who had good reason to look for better treatment.

Ligature.—Chelius, at paragraph 291, describes his mode of securing a divided artery, as follows:

"In tying arteries the surgeon must endeavour, as much as possible, to include none of the neighbouring parts in the ligature, and still not completely to isolate the artery. He seizes the mouth of the wounded vessel with the forceps, by laying the points of the instrument on each side of it, and gently drawing it forwards. An assistant carries a round, not very thick, but sufficiently strong, waxed silk ligature, about the vessel, ties a single knot, and, whilst he holds the ends of

the ligature with both hands, he draws the knot somewhat together, presses with both his fingers upon the artery, draws it sufficiently tight, and then makes a second simple knot."—(Vol. i. p. 336.)

But, says Mr. South:

"I do not quite agree with Chelius as to the incomplete isolation of the artery before applying the ligature; but I do fully participate in his preference of the forceps to any other instrument for drawing out arteries. I always use two pair of forceps for taking up a large vessel; drawing it out with one pair, in the way he recommends, and then with the other clearing it entirely of *all* its surrounding connections. This was the younger Cline's practice, and I think very good, as it certainly excludes the accompanying nerve, which often excites severe pain and irritation. I am not, however, sure that the complete separation from the neighbouring parts at all hastens the throwing off the ligature.

"The tenaculum is the instrument more generally employed in this country for taking up arteries; but I think it objectionable, as it commonly lifts up a large mass of soft parts which ought not to be included in the ligature."—(Vol. i. p. 337.)

It is rather singular that Mr. South should urge as an objection against the tenaculum, the very objection that its inventor, Bromfeild, (see his *Chirurgical Observations*, vol. i. p. 160,) long ago urged against the needle, and other instruments, which it was intended to supersede. We cannot appreciate as of any value Mr. South's objections to the use of the tenaculum. We have usually found it more convenient than the forceps as an instrument for seizing the artery, for holding it securely and separate from the surrounding soft parts, for guarding these soft parts against pressure and contusion, as well as for preventing bungling manœuvres in placing the ligature upon the vessel. We agree, however, with both Chelius and his commentator, as well as with most other sensible surgeons of the present day, in preferring the common round ligature of silk thread to all other contrivances that have been recommended, and that are still occasionally brought to our notice, under the name of animal ligatures—as if silk thread were not itself an animal substance, and as if dead animal matter introduced within a wound were not as much a foreign body, and as liable to excite irritation and prevent the union of the wound, as so much simple vegetable or mineral substance. And as to the speedy liquefaction of such ligatures, we hold that this is among the serious objections that should be urged against them, and it more than counterbalances the usually trifling inconvenience of having the end of a fine silk ligature lying on the lips of a wound.

The following suggestions for removing the ligature where it has been too long retained, are worthy of passing notice. They are from Mr. South's notes.

"Some surgeons, when a ligature has been long retained, pass a probe by its side, as low as it will descend, and then twist thread and probe round until both come away together. But I prefer the younger Cline's practice of putting a thin whalebone spring upon the thread, the constant pull of which upon the knot makes it press against the obstacle which prevents its coming away, and produces ulceration, which sets it free often in the course of the day; but if not, the thread must be daily twisted on the spring, so as to keep it tight till it comes away. Another method is to roll the thread, close up to the wound, on a bit of bougie or wood, and prevent its uncoiling by fixing it with adhesive plaster, but the former plan is preferable."—(Vol. i. pp. 340, 341.)

The following note in regard to securing vessels at the bottom of deep wounds, should not be overlooked.

"Another point in reference to taking up wounded arteries is also not to be

overlooked, namely, that if that side of the limb at which the wounding instrument have entered be at a greater distance from the artery than the sound side, it is preferable to cut down upon the vessel at the uninjured part. I recollect some years ago seeing this practice adopted with great success by my friend Travers. The patient had received a scythe wound on the outside of the leg, and the scythe passing across had wounded the posterior tibial artery, but did not penetrate the skin on the inside of the leg. Attempts were made to get hold of the vessel by enlarging the wound, but its depth was so great that they were fruitless. An incision was then made along the inner edge of the shin-bone, and the artery without difficulty secured."—(Vol. i. p. 338.)

Dissection wounds.—Passing over, for want of room, many other important points in the section on wounds, we next turn to a note of Mr. South's, in which he appears disposed to deny the poisonous character of dissection wounds.

"The question of absorption of poisonous matter into wounds, received in dissection, has been much disputed. But I must confess, that, after nearly twenty years' constant employment in the dissecting-room, I almost entirely agree with the opinions held by Lawrence on this subject. 'It seems to be very doubtful,' says he, 'in those cases, whether anything actually venomous or virulent is introduced, or whether the results of these injuries must be said to arise from such wounds, considered merely as mechanical wounds. If these be poisonous wounds, the poison certainly follows other laws than those we observe in cases in which we are more intimately acquainted with the poison. * * * If they arise from a poison, then it is one of a very uncertain, and, almost, you might say, capricious kind."—(Vol. i. p. 385.)

"The most certainly dangerous punctures, as far as my observation goes, are those which have happened in the examination of cases of peritonitis, either of the common or puerperal form; which certainly would lead to the presumption that, in such instances, there is an absorption of poison. But, on the other hand, I am sure that almost if not quite as severe symptoms have occurred when the wound has been received in examining a body recently dead and quite fresh. With regard to putrid subjects, or those just beginning to be so, my experience proves that wounds from them are almost invariably the least formidable kind. How these facts are to be explained other than by the assumption of a peculiarity in the constitution at the time of receiving the wound, I do not presume to say; but certainly, as regards the affections from peritoneal disease, there does not appear to be a very strong presumption of poisonous matter having been absorbed."—(Vol. i. p. 386.)

Chelius, in his remarks on dissection wounds, notices their capricious character; but he is not so decidedly disposed to deny that they may occasionally give admission to a poisonous principle. After having paid some attention to this subject, we have no doubt that, in some instances, dissection wounds actually do give admission to a morbific principle; whilst in others the disease arising from them is simply the result of local irritation. In some instances we find them exciting violent inflammation which is mostly confined to the neighbourhood of the wound; in others a less severe local irritation will lead to inflammation of the absorbent vessels as well as to sympathetic disturbance of the system; in others again, with scarcely any local disturbance, with no inflammation of the absorbents, and even without any actual abrasion of the skin, there will suddenly ensue, after an interval of a day or two, axillary swellings, rigors, irritability of the stomach, and, at length, a general febrile movement of the system, of a low nervous character, which may continue for weeks, and even result in death. Now, that cases of the latter sort are to be accounted for on the supposition that there is no morbific influence conveyed from the cadaver, we are not willing to allow; and one reason we would assign for the conveyance of

such an influence, is the fact admitted by Mr. South himself, and which he is unable to account for, viz: that severe accidents following dissection wounds, are more apt to occur after examining subjects recently dead, than after examining those that are already far advanced in putrefaction. They are more frequent after post-mortem examinations, than after cuts received in the dissecting room.

Some years ago having had occasion, while in perfect health, to examine the body of an old lady who had died of an ovarian tumour, we had our hands for some time immersed in the jelly-like contents of the sac, and might have come in contact with some chloride of lime that was placed about the body; but whether such was the fact or not, we are certain that we received no puncture or incision of any sort during the examination. On the following day we observed about our hands a few minute vesications, which were cauterized, and gave no further trouble. On the second evening after the examination these vesications had not ceased to appear, and one of them was observed on one of the fingers of the right hand just before retiring to bed. This one was not touched with caustic. About the middle of the night, without any previous warning, we were awakened in a violent rigor, with agonizing pain and a hard lump in the axilla of the right arm. At this time the finger was giving no uneasiness, and there was no redness or soreness in the course of the absorbents. The rigor continued for the rest of the night, followed by vomiting and great gastric irritability during most of the next day. There ensued a protracted fever of a nervous type which continued about three weeks; and during more than half of this period the swelling in the axilla was not among the least troublesome of the symptoms. It may appear rather remarkable; but, we have rarely made a post-mortem examination since recovering from this attack, without observing the same sort of minute vesications about our fingers; and having invariably touched them with caustic as soon as they appeared, we have never experienced any further ill effects from them.

Wounds of the Head.—In the second subdivision of the section on wounds, while treating of wounds of the head, we find Chelius and Mr. South again at issue, in regard to the escape of extravasated blood, and the depth to which we may be allowed to proceed in search of it.

"If the extravasation be beneath the skull," observes the former, (paragraph 419), "it flows out after trepanning." "This is a very incorrect statement," says Mr. South. "The blood rarely if ever flows out after the trepan has been applied." According to our own recollection on this point, we would say that in this dispute, as in many others, there is reason on both sides. It is not so very rare to see the escape of blood after the application of the trephine; and yet as a general remark, Mr. South's words are correct when he states, in regard to the extravasated blood beneath the skull, that, "It is almost invariably found coagulated; and, therefore, though a little bloody serum may escape, the bulk of the blood still remains upon the dura mater, and always requires removal by careful scraping with an eye probe, or with the edge of a spatula where it can be easily reached."

Again: "If the *dura mater* be stretched, violet-coloured, fluctuating," says Chelius, "it may be divided by a suitable cross-cut. If the extravasation be beneath the *pia mater* it also must be cut into." "But," says Mr. South, "there has been great difference of opinion amongst the surgeons of this country in regard to the propriety of puncturing the membranes of the brain, when extravasated blood is presumed to be between

the *dura mater* and the brain; and I must confess I am rather disposed to agree * * * with those who think little advantage likely to result from cutting through the *dura mater*." He goes very fully into an examination of authorities on this point; but, in these we cannot follow him. His position we believe, on this point, is well taken. The practice recommended by Chelius may in some instances be justified; but his advice should not be followed rashly. The bulging up of the dura mater into the opening made by the instrument, is no proof whatever of extravasation beneath it; nor is the apparent feeling of fluctuation. Even the dark colour of the membrane may be owing to other causes. We have seen surgeons of great experience commit errors in regard to these appearances, and discover their mistake only after having freely divided the protruding dura mater.

The Condition of the Brain induced by Concussion is a question of some interest, and is spoken of by Chelius as follows:

"The changes produced on the brain by concussion are various, and may be divided into primary and consecutive. They consist either *in a sudden depression of the activity of the brain and nerves*, in which after death no trace of any mechanical injury, frequently only a sinking together of the brain, which does not completely fill the cavity of the skull, is found; or in *tearing of the vessels*, or even of *the brain itself*, and *inflammatory congestion*. In concussion the vessels of the brain are always more or less debilitated, so that when the first symptoms of concussion have passed by, they cannot withstand the subsequent influx of the blood, and in this way gorging with blood and its effusion through the relaxed walls of the vessels takes place. In concusion of the brain there are, therefore, various conditions to be remembered, namely, *torpor* and *weakness of the nervous system, irritation and inflammation, extravasation*, and not unfrequently *concurrent affection of the liver*."—(Vol. i. p. 451.)

As to the affections of the liver sometimes co-existing with injury of the brain, it is questionable whether or not the injury of the brain has had any direct agency in their production. The co-existence of abscess of the liver with injury of the brain was, if we remember rightly, first distinctly pointed out by Ambrose Paré; and many other surgical and pathological observers have, since his day, referred to it. The coincidence, however, is not a common one; and when it does occur, the disease in the liver, we are disposed to believe, may in most, if not all cases, be attributed either to local injury, to the secondary effects of phlebitis, or to the effects of constitutional disturbance upon an organ already predisposed to diseased action.

We cannot stop to notice any other of the local injuries spoken of in this important section. The author, in connection with wounds, takes up some of their constitutional effects, and these, too, we must pass unnoticed. We would only observe, that in connection with wounds about the neck and throat, we find no notice of an accident that should here have been alluded to, we mean the admission of air into the veins—a subject which has of late been very thoroughly investigated by the surgeons of Great Britain, as well as by others, with whose publications and labours Mr. South can scarcely be unacquainted.

Fractures.—In this section of the work we have noticed but few points of difference between the surgery of Germany and that of our own country; and in the four that we have noticed, we find that Mr. South has, in his notes, anticipated most, if not all, that should be said upon them. We cannot refuse a place to the sensible remarks of Mr. S. on the impropriety of extensive division of integument, and of the removal of sections of bone by the saw, as often and needlessly resorted to in cases of compound fracture.

"Enlargement of the wound in compound fracture should not be lightly undertaken, and as far as my experience goes, is not often requisite; for if the surgeon have a little patience and dexterity, a protruding fracture may often be coaxed, if the expression may be permitted, to recede into its place, when force is quite unavailing. Should it, however, be necessary to enlarge the wound, the operator should carefully select such part of it as with least division will permit the return of the bone.

"Sawing off the protruding portion of the fracture is still less necessary than enlargement of the wound, and should never be resorted to but on the most urgent necessity. I believe that in but exceedingly few instances its needfulness depends rather upon the incapable conduct of the medical attendant than on the nature of the accident itself.

"Loose pieces of bone, if not of large size, but lying between the main parts of the fracture and near the surface, especially if the wound be large and there be much bruising, are best removed at once, as they rarely unite, and commonly keep up irritation till they are thrown off: not unfrequently also they prevent the union of the main pieces, and render amputation necessary.

"During the progress of compound fractures, abscesses often occur, sometimes near to, sometimes more distant from, the wound. If after a few days they do not make their way to the wound, and empty themselves by it, or if after having so done, they burrow beneath the skin, it is best to puncture them, to favour the ready escape of the matter; but large wounds for this purpose are neither necessary nor advisable."—(Vol. i. pp. 559, 560.)

Mr. South is an opponent to all complex and fanciful apparatus for the management of fractures, as in other departments of surgery. In this he is a man after our own heart.

"I must confess that I consider the more simple are the means employed for treating either simple or compound fracture the better. The starched and gummed bandages have rendered this part of surgical practice as simple as it is efficient, but if the surgeon prefer wooden splints, he can always readily furnish himself, with or without the aid of a carpenter, with pieces of deal about three inches wide and the sixth of an inch thick, which he can cut to the requisite length for the limb on which the splints are to be applied. These, together with pads and bandages, are sufficient for the treatment of almost every fracture, either simple or compound; for the surgeon will do well to remember that the well-doing of the case depends rather on the way in which he adjusts the apparatus of whatever kind it may be, than on the gimcrackery with which some mechanical surgeons are fond of furnishing it."—(Vol. i. p. 562.)

The second volume of Chelius's Surgery opens with a section, which, under the heading of "Old Solutions of Continuity," includes a vast amount of heterogeneous topics, and includes some disorders such as hare-lip and cleft palate, which are arrested developments, and as such, not entitled to a place here. The first topic that strikes our attention is one that very naturally comes in after fractures, viz:

Unnatural Joints.—When the two ends of a broken bone not firmly united by cartilage, have received a sort of cartilaginous investment; or when, from any cause, they remain ununited for a period of six months or more, and the ends of the bone are still movable, our author would consider the case one of false joint. Unnatural joints of this sort "have been noticed in almost every bone, but they are most frequent in the upper arm." There is one form of unnatural joint for which he leaves no room in his descriptions, viz: that which is congenital, and which can scarcely be attributable to fracture. Among the various reasons which our author assigns for accidental non-union after fracture, we see no allusion to one cause which we are disposed to believe not the least common of the causes that give rise to it. We have reference to the early and prolonged use of tight bandaging,

which, leading to atrophy of the limb, and interrupting the deposit of callus, is apt to arrest the reparative process, especially in the upper arm, where pressure would naturally have the greatest influence in this way, and where, in fact, the accident is most frequent. The usual modes of treating false joints are all mentioned in their turn, and we need not here enumerate them. But the procedure instituted by Dr. J. K. Rodgers of New York, and which has hitherto been mostly confined to that city,—excision of the ends of the bone and subsequently keeping the parts in coaptation by means of a wire suture—has found no place either in the text or in the notes of the commentator.

Dislocations.—There is a form of spontaneous dislocation that occurs mostly in growing children, as the result of arrested growth of the muscles, &c., about a joint; and another which may occur from atrophy of these muscles, &c., in adults; and which sometimes depends on chronic synovitis, or disease of the articular cartilages, more especially in the shoulder-joint. Of these accidents we see no notice in Chelius's account of dislocations, and these are the only admissions we see, to be supplied under this head; unless we should also wish to have admitted a notice of some recent instruments for the readjustment of bones; and which, we suppose, Mr. South, who must have been acquainted with them, could class among his "gimcrackeries."

The following passage on the reduction of a dislocation at the hip, is worthy of recollection.

"In the dislocation downwards Astley Cooper used to say, in his Lectures, that it might be reduced by interposing the bedpost between the thighs close up to the *pelvis*, and then making extension.

"Morgan and Cock, of Guy's Hospital, have reduced several dislocations of the hip-joint by placing the foot between the thighs, so that it presses against the upper part of the dislocated bone, and thrusts it away from the *pelvis*, extension and rotation of the limb being at the same time made by assistants. The principle of the operation is precisely similar to that in reducing a dislocated shoulder by putting the heel in the arm-pit. This practice was first introduced about ten years since by Morgan, (*Guy's Hosp. Rep.*, vol. i. p. 79,) and by it he has replaced a dislocation upon the *pubes*, one on the oval hole, and one upon the back of the hip-bone without difficulty, which he principally attributes to diverting the patient's attention from the operator's efforts by unexpectedly pricking or pinching. Cock has reduced one dislocation on the *pubes*, and two on the back of the hip-bone, by the foot between the thighs; but he informs me that the greater number of the persons so treated were weak or elderly. Till making inquiry, I was unaware of so many cases having been thus managed; I do not know that the practice has been elsewhere adopted, but I shall certainly try it, at the first opportunity, as it saves all the trouble and inconvenience of *pelvis*-straps and pulleys."—(Vol. ii. p. 242.)

Wry Neck.—We must next pass over nearly two hundred pages of important matter, among which are ulcers in all their varied forms, syphilis, necrosis, fistula, hernia, until we arrive at paragraph **1334**, where we find our author speaking of the causes that may give rise to wry neck.

"The most frequent *cause* of wry neck is unnatural muscular activity. It is either congenital and depends on irregular position of the child in the womb; or it arises from violence during delivery, which affects the *m. sterno-mastoideus;* or it comes on later from the habit of always hanging the head to one side, especially in children, if they be constantly carried on one arm; if, on account of the continuance of any pain in the neck it be inclined to one side, by spasm and organic change in the structure of the *m. sterno-mastoideus.* If the cause lie in the unnatural activity of this muscle, it is always found, on the side to which the head is drawn, stretched like a cord, hard and unyielding; in attempting to bring

the head into its proper position, the muscle becomes more tense and prevents it. It is really only the *m. sterno-mastoideus* which is primarily shortened, and most commonly on the right side; rarely, also, the *m. cleido-mastoideus* and *cucullus;* the *m. platysma myoides*, may also be shortened. Frequently is the *m. sterno-mastoideus* of one side palsied, and the natural contraction of that of the other draws down the head. In this case the dissimilarity of the two sides of the face and the distortion of the features are not so great as in wry neck from unnatural muscular contraction; the head is drawn only towards the shoulder, but the chin is not raised. That the cause of the evil is in the bones is known, when no change can be observed in the muscles, and the general symptoms of softening of bone be present. The head is also usually more movable than in the former cases.—(Vol. ii. p. 422.)

In a note appended to the foregoing, he stated that he has seen wry neck induced by the application of a blister behind the ear. We might further observe, that it frequently is associated with, or follows inflammation of the tonsils, and other parts about the throat; the irritation extending from these parts downwards in the course of the deep fascia, and giving rise to the muscular contraction. Thus induced, it will sometimes subside in a few weeks after the disease in the throat has yielded; but in other cases, it does not so readily disappear.

Lateral Curvature of the Spine.—Mr. South has a sensible note upon what he considers a very frequent cause of this form of distortion, which at the risk of being prolix, we must refer to.

"The most common cause of a high shoulder, is to be found in the abominable practice of undressing girl's necks, as low as the hanging on of their clothes will permit. Instead of the shoulder straps of their dress being as they should be, fairly above the root of the acromial processes, they often, indeed most commonly, either only skirt the extreme end of those processes, and rest on the rounded upper part of the deltoid muscles, or are actually far down on the arms; in consequence of which, the dress having little or no suspension on the shoulders, is constantly dropping, and the girl to save her clothes dropping down, or at least to keep them in place, is continually hitching up the shoulder from which the shoulder-strap most easily slips, and thus the elevating muscles becoming stronger on that side, pull the shoulder permanently up, and produce a very ugly appearance. But the mischief does not stop here, for though there be really no disease in the spine, yet this constant hitching up of the shoulder causes the head and neck to be thrown to the other side, whilst the chest is drawn out to the same side, and thus a lateral curvature of the spine is produced, and a girl's figure spoiled, for the simple purpose of uncovering her neck and shoulders as far as possible, which, as well for decency, as for the preservation of the child's health, ought to be covered. Many parents have been thus the real cause of their daughters' distortion, if not of more serious consequences; and therefore, in growing girls who have the least disposition to slip their shoulder out of their dress, most especial care should be taken to prevent the possibility of keeping up this habit, by having the dress made so high, that it cannot slip down, and then the sensation of its slipping being lost, the child no longer continues to hitch up her shoulder, and by a little attention to her proper carriage, the mischief, if not of long standing, may be got rid of.—(Vol. ii. pp. 428, 429.)

Aneurism.—We notice this portion of Chelius's work, mainly for the purpose of correcting two misstatements which we have met with in other recent publications of this country, and which it is our duty to point out. In Dr. Pancoast's Operative Surgery, it is stated at page 55, while speaking of the *vertebral artery*, that "Nuntiante Ippolito relates two cases in which this artery was tied at its origin with success." This passage attracted our attention while preparing the review of Dr. Pancoast's work; but not having at that time the authority to refer to, by which the statement might have

been corrected, we were forced to pass it by unnoticed. Chelius and Dr. P. both refer to the same authority, in regard of these alleged operations, viz: Froriep's Notizen, 1835, p. 304. But Chelius gives quite another version of the affair.

"Nuntiante Ippolito, who saw two cases of aneurism of the vertebral artery, has proposed the following mode of tying it. After having found the triangular space formed by the external jugular vein, the hind edge of the sterno-mastoid muscle, and the upper edge of the collar-bone, a cut is to be made through the skin, from its top to the base, not exceeding two inches in length. The operator continues penetrating in this direction till he reach the inner edge of the *m. scalenius anticus*, and thus the artery is easily struck upon, without injuring one twig of a nerve."—(*Froriep's Notizen*, 1835, p. 304.)—(Vol. ii. p. 527.)

The vertebral artery, then, has yet to be reached for the first time in the living body, and Dr. J. K. Rodgers, of New York, by his recent operation on the inner side of the left subclavian artery, has come nearer to a demonstration of its practicability than any other surgeon. (See *N. Y. Journal of Med.*, March, 1846.)

The second error in regard to the ligature of arteries for the cure of aneurism, is to be found in Dr. Townsend's version of M. Velpeau's surgery—one of the books at present under consideration. At page 290, volume second of this work, Dr. Mott, while speaking of the possibility of applying a ligature on "*the left subclavian within the scaleni muscles*," says, "He saw the first, and perhaps the only attempt that ever was made to tie this artery. This was by my illustrious and revered preceptor, Sir Astley Cooper. After working indefatigably with all his eminent skill and superlative tact for an hour and a half, he abandoned the operation as hopeless. The patient died in the course of a few days."

The foregoing statement has reference to a case upon which Sir A. Cooper attempted to secure the subclavian artery from "above the clavicle," in 1809; and we can readily allow that after a period of nearly forty years, Dr. Mott's recollection may not be very precise as to facts. It so happens in regard to this case of Cooper's, that Dr. Mott has furnished us with the means of correcting his own error; for, at page 303 of this same volume, he has republished an account of this identical case, from the *N. Y. Med. Repos.*, in which he himself first published it as long ago as 1810. "The situation of the man," says Dr. Mott, in the journal above mentioned, "being truly painful, and it being evident that the disease must prove in a short time fatal, if no operation were to be performed, A. C. was determined to make an attempt to take up the subclavian artery *just after it had passed betwixt the first and second scalenus muscle.*" "The most careful dissection was now necessary, and by means of the edge, and sometimes the handle of the scalpel, the muscles were separated, *till the nerves going to form the axillary plexus, were laid bare.*" Dr. M. was probably not so good an anatomist in 1810, as he is at present, or he would have left out all that he says in this paper about the great risk that Cooper ran of coming in contact with the thoracic duct, while laying bare the nerves of the tracheal plexus. But, independent of this oversight, his first report proves to our satisfaction that Cooper's attempt was not upon the vessel at the *inner side* of the scalenus. Dr. Mott, however, as we are credibly informed, is not willing to relinquish his more recent view of the matter; and although the inconsistency of his two statements here placed side by side has been elsewhere pointed out to him, he has made no attempt to put himself right, as he might have fairly done, in his notes to the last volume. It

becomes us, therefore, to look to other authorities in regard to this well-known case of Cooper's.

First, then, let us turn to M. Velpeau himself. "M. Ramsden," says Velpeau, (vol. ii. p. 217), "who performed his operation in 1809, appears to have been the first who actually tied the subclavian artery. Some time before him Mr. A. Cooper had tried, but in vain, to seize this vascular trunk; he tied a nerve instead of it, and the patient soon died of hemorrhage."

Mr. Samuel Cooper, under the head of axillary aneurisms says there are two modes of operating; "one by cutting below the clavicle," "the other by making the wound *above* the bone for the purpose of securing the subclavian artery at the point where it emerges from behind the anterior scalenus muscle," and in speaking of the latter mode of procedure, he alludes to Sir Astley Cooper's case, attributing the failure of the latter to the want of the aneurismal needle, which was not in use at that period. In the *London Medical Review*, for June, 1809, (vol. ii. p. 300,) is to be found the first notice of this operation, where it is spoken of simply as an attempt to secure the subclavian *from above;* all the previous attempts having been made on the vessel farther out, and *from beneath* the clavicle. Finally, Mr. South, a pupil of Sir Astley's, and attached to the same hospital with him, refers to this case in his notes to Chelius, in these words:—

"The operation of tying the subclavian artery above the collar-bone was first attempted by Astley Cooper in the spring of 1809, but "the aneurism was very large, and the clavicle was thrust upwards by the tumour, so as to make it impossible to pass a ligature under the artery, without incurring the risk of including some of the nerves of the axillary *plexus*. The attempt was therefore abandoned."—(*London Medical Review*)—(Vol. ii. p. 518.)

With these authorities against him, it is to be hoped that Dr. M. may not take it amiss that the profession are not disposed to place much reliance on the statement which he has advanced in regard to Sir Astley Cooper's operation.

Varices.—The more we approach to topics of operative surgery, the more we are diverted from the pathological details of Chelius and Mr. South to the fuller operative details of M. Velpeau. To the former we may look for a short account of the pathology of varix, and to the latter for a very full enumeration and fair appreciation of the several modes of cure. On the whole, we are less satisfied with Chelius's article on the subject of varices, which gives marked evidence of having been written long ago, than with almost any other in his book, and in one point we believe the practice which he recommends would be as inefficacious as it is unsafe and improper.

"*Puncture of the varix* with a lancet (anciently proposed by Hippocrates) must especially be employed in varices largely filled with coagulated blood, as well also as in those which are very painful, inflamed and much expanded; and, after the removal of the blood, pressure, together with cold applications and the horizontal posture are to be employed.

"In cases of larger size and greater extent, the skin and the vein must be *cut into*, by an incision two inches long, upon the largest knot, the escaping blood kept back with the finger, the cavity of the vein plugged with sponge or lint introduced into it, and the bleeding staunched by the application of compresses and circular bandages. If the varicose expansion be only on the leg, one cut is sufficient; if it extend to the middle of the thigh, one cut is to be made above the ankle, a second close above the knee, and if the whole thigh be affected, a third cut is to be made at equal distance. The limb is then to be bandaged, and cold

applications to it used for some days. Inflammation takes place in the vein which so spreads from the principal to the other varix, that a greater degree of plasticity arises in them, and the neighbouring varices disappear.—(*Graffe, in his Introduction to C. Bell's Surgery.*)—(Vol. ii. p. 571.)

We hold that the danger incidental to operations on varicose veins, has less to do with the special mode of attacking them, than with the condition of these vessels at the time of operation; and that they should never be interfered with by any sort of operative procedure, whether that be the knife, the ligature, the pin, or the potential cautery, when in a state of inflammation.

We have now noticed some few of the more prominent topics calling for observation or criticism, in the first two great divisions of Chelius's work; and have not yet touched either of the remaining six, which occupy the whole of the last volume. We are reluctantly obliged, for want of space, to pass over all that is said of diseases depending on unnatural coherence of parts; all that is said on the presence of foreign bodies and retained secretions, including among other important topics the great subject of urinary concretions, and the operations for stone; all that is said of organic degenerations and adventitious growth, including an elaborate account of tumours, one of the most valuable and able chapters in the whole work; all that is said on the loss of organic parts, and on the superfluity of parts; and, finally, all that is said in the eighth or last division, on operative surgery proper, excepting only one or two questions on

Disputed and Suppressed Claims of Priority.—It is comparatively within a recent period that medical periodicals have sought with so much avidity to herald into notice every trifling operation. The surgeons of former days do not appear to have been so fond of notoriety, as at present many of them are, for feats of daring upon the living body. There is a charming modesty pervading the writings of most of the older masters of the art, who, in describing their own operations and inventions, leave to others the business of discovering their originality; and the discovery is often only made by comparing their writings with those of their predecessors. Far be it from us to detract from the credit of any one who has justly signalized himself by improving the practice of our profession, or by enlarging its means of usefulness; and yet we do believe that the present fondness for striking out bold procedures in surgery, is a morbid taste that must sooner or later yield to common sense; and that while it lasts it must have a deleterious influence upon human life. The skill required for such performances is by no means so great as many are disposed to think. And it should be a lesson to those who are continually hunting for renown in this manner, to find, that the feats by which, for a while, they imagine they have earned it, have actually been anticipated by obscure and unlettered individuals, as unknown to fame, as they are heedless of precedent. He who establishes a principle in our art, such, for example, as that of Hunter's for the treatment of aneurism, is worthy of being forever remembered; but he who establishes a process merely, exhibits a certain amount of ingenuity which most other sensible men, under the circumstances, might have displayed as well.

1. *Excision of the Lower Jaw.*—Dr. Mott, as we have already shown, has very properly relinquished all claim to having been the first in this country to follow Larrey in amputating at the hip-joint. But he is not so willing to relinquish his claim to *originality*, (he does not say *priority*,) in respect to excision of the lower jaw; and yet in a note appended to his

reclamation, he apparently with reluctance refers (Velpeau's Surgery, vol. ii. p. 917) to Dr. W. H. Deadrick, of Tennessee. We need not at present allude to the erroneous account of Dupuytren's operations on the jaw as given in the "Report of a Committee," &c., which we find reprinted in the second volume of this translation, (p. 902.) The "Clinique" of Dupuytren, (vol. iv. p. 628–33,) has only to be consulted to put this matter right. Dr. Mott was, perhaps, after Graefe, the first to publish an account of an operation for the removal of a portion of the lower jaw. Thus far, but no farther, should his claims be urged; and such appears to be the opinion of Mr. South, who gives the following summary, as to the result of all that has been said upon this question.

"As will be presently seen, DEADRICK was the first who, in 1810, cut away the side of the lower jaw; in 1812, DUPUYTREN sawed off a large portion of the front of the jaw; in 1816, ANTHONY WHITE removed half a necrosed jaw from the socket; in 1818, ASTLEY COOPER sawed off the projecting part of the chin; in 1821, GRAEFE removed the front of the jaw; and in the same year, one-half of the lower jaw, which he exarticulated, and the patient lived: MOTT's first operation, in which half the jaw was removed, by sawing through the chin and across the ascending branch, was performed in March, 1822; his second, in which he exarticulated one-half, in May, 1822; died on the evening of the fourth day. CUSACK removed the left half of the jaw in 1825, first sawing through the horizontal and afterwards the ascending branch, and then exarticulating the condyle. These several cases will be referred to presently.

"I have thought it well to give this brief historical account of the amputations of the lower jaw, the authorities for which the reader can refer to; because the French claim excision of the jaw for DUPUYTREN, and the Americans, exarticulation of the jaw for MOTT; but neither of these justly-celebrated surgeons have title to the origination, or to the first performance of either operation, and their reputation will lose nothing by the just meed of merit being awarded to others, of whom, probably, their too ardent admirers had no cognizance."—(Vol. iii. p. 745.)

2. *Excision of the Upper Jaw.*—The upper jaw has been attacked in several modes: First, by scooping and chiseling; in this way tumours and morbid growths of great size, and in some intances perhaps involving the whole bone, were removed, centuries ago. Secondly, by the spring saw; in this way the greater portion of the bone has been excised without touching the morbid mass at all. To Dr. A. H. Stevens, of New York, belongs the credit of this procedure. M. Velpeau has properly awarded him such credit; but neither Chelius, nor Mr. South, has alluded to the operation. Thirdly, by amputation, or extirpation; in which the bone is wholly removed by detaching it from the other bones of the head with which it is naturally united. This last operation belongs to M. Gensoul, of Lyons; but Mr. Lizars, of Edinburgh, appears to have, prior to the publication of M. Gensoul's memoir, shown the feasibility of the procedure.

3. *The Speculum Oris, or Screw Lever.*—"We cannot permit ourselves to believe," says Dr. Mott, (Velpeau, vol. ii. p. 882,) "that any surgeon of rank, possessing the high moral character which it is presumable should, or we might say must, necessarily belong to at least the distinguished members of the medical profession, as the guarantee of eminence and respectability, would willingly or wilfully deprive another of the honour that belongs to him. It is therefore through sheer inadvertence or ignorance, which some might call culpable, of the true facts of the case, that might have permitted a surgical gentleman * * * to promulgate, as it were, ex cathedra and 'by authority,' to the rest of the world, the following, * * without a single word of qualification in behalf of any other individual whatever."

It is a good rule that works both ways, and Dr. M. should have remembered that what he was writing in his own defence, about excision of the lower jaw, might, with equal force, be turned against himself in other quarters. We need not allude to claims for the suppression of which he is in some degree accountable, as joint editor of a work purporting to comprehend all the latest improvements and discoveries in the surgery of America; under which head we might point to at least one omission, remarkable only to those who are aware of the circumstances in regard to a recent operation for the relief of stricture of the œsophagus, which was original as respects this disease. But we cannot pass over his rather strange assumption to the authorship of what he calls his screw lever for overcoming rigidity of the lower jaw, the fac simile of which as he had depicted it, may be found by any one who takes the trouble to turn to the twentieth plate of Heister's Surgery, vol. ii. page 31. Heister, indeed, would have this instrument employed only as a *speculum oris*. As a means for forcing open rigid contractions of the jaw he would not recommend it. He even declares that for such purpose every prudent surgeon should reject it as pernicious. And his opinion is borne out by a fact which we see mentioned in Dr. Townsend's Supplementary Appendix to the second volume of Velpeau, where it is stated that this very instrument in the hands of one of Dr. Mott's most skilful and accomplished pupils, was the means of fracturing the jaw-bone.

We must now bring to a close our hurried and imperfect notice of these two voluminous and important publications. In the work of Chelius, as translated and amplified by Mr. South, the practitioner will find the fullest and ablest digest extant, of all that relates to the present advanced state of surgical pathology; and a sufficient account of the principles and processes of operative surgery, to enable him, with a fair knowledge of anatomy, and a little ingenuity of his own, to undertake and execute any operation he may be called upon to perform. In the work of M. Velpeau, on the other hand, besides the miscellaneous, and sometimes valuable additions of the editors, he will find the whole art of operative surgery regularly systematized, and in such a manner that there is scarcely an operation possible, and none that he will be called upon to perform, for which he may not only find a precedent, but also all the details necessary for carrying it into successful execution.

With the exception of a certain redundancy of words, and a disposition to indulge rather too often in what may be called a *magno cum strepitu* strain, Dr. Townsend's labours, as editor and translator of M. Velpeau's work have, in a literary point of view, been very creditably performed. His notes and additions, as well as those of Dr. Mott, not always in keeping with the general character of the original work, are printed in the same type as the text, and rather too intimately incorporated with it, being usually separated only by brackets. The typography of this work, and the atlas of lithographic plates that accompany it, are worthy of commendation. Mr. South, as translator and editor of Chelius, has, after the original, dropped the usual titles of address. The frequent use of the German Mein Herr would certainly have been rather awkward; but the English Mr. and the French M. are easily introduced, and have the advantage, not a trifling one, of giving the reader to understand that the individual thus mentioned is still upon the land of the living. Mr. South attempts no refinements of diction; he speaks in unaffected English; but he is sometimes too English to be elegant. We have noticed a few cockneyisms, such as "immediately"

for immediately after;" a few slang terms, such as "gimcrackeries" and "nicknackeries," and a few technical terms that might as well have been translated in accordance with common use. "Shoulder-blade" and "blade bone" will do well enough for scapula; "collar-bone" for clavicle; "shin-bone" is quite endurable; but "spoke-bone" for radius, is rather new; and "rump-bone" for sacrum, whatever it might have been in the days of Cromwell and the Long Parliament, is at present, at least in surgical terminology, rather obsolete. The mechanical execution of this work is also quite commendable. J. W.

ART. XIII.—*Lectures on the Physical Phenomena of Living Beings.* By CARLO MATTEUCCI, Professor in the University of Pisa. Translated under the Superintendence of JONATHAN PEREIRA, M. D., F. R. S., &c. London: 1847. 12mo. pp. 435.

IN 1844, Professor Matteucci was appointed by the government of Tuscany to deliver, in the University of Pisa, a course of lectures on the Physical Phenomena of Living Beings. These lectures were subsequently published; and their popularity is attested by the fact, that they have already passed through two editions in Italy, and one in France.

The present translation has been made from a copy furnished to the editor by Professor Matteucci, and containing a very large number of additions and corrections. The numerous errors of the French edition,—so far as matter is concerned more complete than the Italian ones,—have been corrected by the author in the present translation, and he has also embodied in it the results of his more recent investigations. A few notes and some additional wood cuts have been appended by the editor, Dr. Pereira. In compliance with the request of Professor Matteucci, the work is most appropriately inscribed to Dr. Faraday, "to whom," as the editor justly observes, "the physical sciences are indebted for some of the most brilliant and splendid discoveries of this prolific age."

Lecture I. is introductory and treats of generalities.

"It is perhaps the first time," says Prof. Matteucci, "that a course of lectures, under this name, has been introduced into medico-physical education. We have no work which treats exclusively of this subject: the germs, indeed, are scattered here and there, but hitherto they have never been viewed in the light most favourable to their development." (p. 2.)

Living beings are endowed with the general properties of all natural bodies. Living organized matter is extended, impenetrable, divisible, and porous. How can we believe that caloric, electricity, light, and chemical affinity, act on these beings in a manner entirely different from that which they are known to do on the other bodies of nature? Many of the differences between, and even of the presumed opposite characters of, organic and inorganic bodies, found in the works on Physiology, have little or no value.

"Animals and vegetables grow by intussusception, minerals by juxtaposition;—in other words, in the former, growth takes place by internal juxtaposition, in the latter by external juxtaposition; for organized bodies conceal in their interior the

dissolved elements of new formations, whilst, on the contrary, these elements are situated externally in the case of inorganic bodies."—(p. 3.)

All the phenomena of living beings are, however, not explicable by reference to physical and chemical forces merely; and even *the most physical, the most chemical* phenomena of living beings exhibit considerable differences in the mode of action of physical and chemical agents in the organism, and which are as yet inexplicable by our knowledge of the laws governing these forces—as, for example, the peculiarities of vision, a purely physical phenomenon; for, how, by the aid of physical laws, can we explain the perception of a single object in its natural position, by a double and inverted image?

"The chemical action of light, which decomposes carbonic acid, carries the carbon under the form of new combinations into the interior of vegetables, disengages the oxygen, and thus produces what the most powerful chemical affinities cannot accomplish, is certainly different from that which decomposes some oxides and metallic chlorides, an effect for the production of which the feeblest chemical actions are sufficient. Apply an electric current to the nerves of a living animal, and the peculiarity of the resulting phenomena will prove to you the immense difference which exists between the effects of the great forces of nature, according as the body in which they occur is living and organized, or inorganic and dead."—(pp. 7, 8.)

What, then, is the cause of these extraordinary differences in the modes of action of physical agents on living beings and on other bodies of nature? This primary question of the highest importance, is one to which, in the existing state of our knowledge, no satisfactory reply can be given. We can only conclude that the fact of organization, and the molecular structure of living beings effect important modifications in the action of physical and chemical agents. Every day, however, adds to the number of those chemical phenomena, what are inexplicable by the ordinary laws of affinity alone—the *actions of contact or catalysis*. To this category of phenomena belong the various kinds of fermentation. And the number of catalytic actions in living beings is immense. The whole mechanism of cell-life is explained by aid of the phenomenon of endosmose alone, effected entirely under the dominion of physical forces. But, while we thus properly conclude, that living beings have the general properties of all the bodies of nature, and that these properties are influential in the production of the phenomena proper to them; that the great physical agents, caloric, light, electricity, and molecular attraction, act on living beings as well as on all the bodies of nature, and that their action must necessarily be influential in the peculiar functions of these beings; and that the general mode of action of these forces is often modified, when acting on organized matter, owing to a difference in its structure and chemical composition;—we must still admit in living beings phenomena, numerous and highly important, which we call vital, and that we are unable to explain how their production can be influenced by physical agents.

With these preliminary remarks, we shall proceed to *Lecture II.*, which is devoted to the consideration of *molecular attraction, capillary forces, and imbibition*. To comprehend the phenomena of absorption and exhalation, it is necessary to understand the purely physical phenomena of capillarity and imbibition, on account of their agency in these functions. When a body is plunged into a liquid, the latter is either elevated or depressed around the solid, and presents, at its point of contact with it, a concave, or a convex surface, according as it is either elevated or depressed. In the

first case, the body is moistened, as glass when introduced into water; in the second, the body does not become wetted, as when the glass is immersed in mercury. When two bodies, sufficiently near to each other, are plunged into a liquid, the latter is either elevated or depressed, according as they are, or are not moistened by the liquid. If we plunge into a liquid, a glass tube open at both extremities, the liquid rises or falls into the tube, and the effect is greater in proportion to the smallness of the bore of the tube. It is twice as great as between the glass plates. In a tube of 1 millimetre (about $\frac{1}{25}$ of an inch) in diameter, the water rises 30 millimetres (about $1\frac{1}{4}$ inches). It will readily be admitted, that capillary actions must exercise great influence over the functions of the tissues of animals and vegetables, when we reflect that the interstices and the capillary tubes of the tissues have a diameter of from $\frac{1}{100}$ to $\frac{1}{200}$ of a millimetre, (about the $\frac{1}{2540}$ to about $\frac{1}{5080}$ of an inch). The concave surface of the elevated liquid, and the convexity of the depressed liquid, belong to a hemisphere whose diameter is equal to that of the tube. The phenomena in question are entirely independent of the volume of the solid body, and consequently the thickness of the walls of the capillary tube are without influence on them. They occur equally in air at the ordinary pressure, in condensed or rarified air, in a vacuum, and in any gaseous medium. But it is in proportion to the temperature of the liquid, and in a greater ratio than that of the diminished density produced by the heat. These elevations and depressions are independent of the density of the liquids. Thus, if we represent by 100, the elevation of water in a tube, that of alcohol will be 40, that of the volatile oil of lavender 37, and that of a saturated solution of common salt, 88. It should be remembered, too, that whatever be the height to which a liquid rises, it never overflows the upper opening of the capillary tube; for the surface of the column of liquid is always concave outwardly. These phenomena depend on that force which is called molecular attraction—a force which is exerted between the molecules of the solid and those of the liquid, and between those of the liquid itself, and which ceases to act as soon as the smallest appreciable intervals separate the molecules. It must be borne in mind that a space completely filled with liquid is incapable of exercising any capillary influence; that the action of a capillary tube on liquids is due, less to the substance of the tube, than to the nature of the liquid with which its inner surface is moistened, and finally that liquids never overflow the upper aperture of the tubes in which they are elevated by the mere agency of capillarity.

The phenomena of imbibition are the same as those of capillary action, and deserve to be more attentively studied than they have yet been. The following are the results of some of the experiments which Professor Matteucci, in conjunction with Professor Cima, made on this subject. They carefully filled six tubes of glass of two centimetres (about $\frac{3}{4}$ths of an inch) with finely-sifted and well-dried very white sand. The ends to be immersed were covered with cloth, and the tubes were then plunged at the same moment into six different liquids, at a temperature of + 12° centig., (= 53° 6′ Fahr.), to the depth of about $\frac{1}{4}$ centimetre (about $\frac{1}{8}$th of an inch); and in order that this depth should be constant, more liquid was from time to time added. The action of imbibition, by which the liquids were elevated in the tubes, was continued for ten hours; at first being rapid, but gradually becoming slower until it ultimately ceased.

"The following are the greatest heights to which the different liquids rose. All

the saline solutions were of the same density, viz. 10° of Baumé's areometer [sp. gr. 1·075].

Solution of carbonate of potash	85 Mill.
Solution of sulphate of copper	75
Serum of blood	70
Solution of carbonate of ammonia	62
Distilled water	60
Solution of common salt	58
White of egg, diluted with its own volume of water	35
Milk	55

This table shows how much imbibition differs in the case of different liquids: in solutions thickened with gum, with boiled starch or with oil, scarcely any imbibition takes place; and it is also very feeble in concentrated saline solutions and in all liquids holding very finely divided particles of solid matter in suspension: in the latter case it effects a kind of filtration. This phenomenon of imbibition may, in the case of solutions holding in suspension very finely divided molecules of solid matter, be very valuable for ascertaining the different properties of the blood according to its density. In fact, in certain maladies, its density and its viscidity are much diminished; and in these cases serous infiltrations take place as they do also, for the same reasons, after profuse sanguineous discharges. We shall hereafter find that alcohol, ether, water, &c., as well as aqueous solutions, when introduced into the stomach of living animals, disappear, but in unequal intervals of time, oil remaining there for a very long period.

"Believing that it would be of importance to compare alcohol at 36° Baumé [sp. gr. 0·844] with distilled water, I provided myself with tubes filled with sand, pounded glass and sawdust, and here are the elevations that I obtained.

Tube with Sand.	Tube with pounded Glass.	Tube with Sawdust.
Alcohol, 85 millim.	175 millim.	125 millim.
Water, 175 —	182 —	60 —

"Thus we see clearly that with either sand or pounded glass alcohol rises less than water; a fact which is in accordance with that which happens with capillary tubes.

"In another experiment I plunged into the same liquid, namely, water, two tubes both holding pounded glass, but the one containing twice as much as the other; consequently the powder was finer in the first tube. The following were the results obtained:—

"In the first tube the liquid rose to 170 millimetres, in the second to 107 millimetres only in the same period."—(pp. 22–24)

The influence of temperature on imbibition is very considerable.

"Two tubes prepared with sand were plunged into water, the one at a temperature of + 55° centig. [= 131° F.], the other at + 15° centig. [= 59° F.], and the results obtained were as follow:—

	Elevation after 70 seconds.	Elevation after 11 minutes.
Tube at + 55° centig.	10 millim.	175 millim.
at + 15 —	6 —	12 —

The important part that imbibition plays in the action of the juices of plants, as well as in the phenomena of the capillary circulation of the blood in animals, is mentioned and illustrated by reference to the experiments of Hales, and the more recent ones of Boucherie. The latter saw a poplar nearly ninety-two feet in height, absorb, by its trunk, in six days, the enormous quantity of sixty-six imperial gallons of a solution of pyrolignite of iron.

The following experiments were made with the view of producing by the mere operation of capillary forces and molecular attraction the effects of chemical affinity.

"If we reflect that any kind of liquid constantly ascends to the same height in a capillary tube; that during imbibition more or less heat is produced, as the experiments of Pouillet have demonstrated; that, moreover, according to Becquerel, there is a disengagement of electricity; and, lastly, that capillary attraction is exerted at very minute distances only, and between the molecules of bodies; we cannot deny that this force combines the principal characters of chemical affinity. We know the experiment of Doebeireiner, that if a mixture of water and alcohol contained in a bladder be exposed to the air, water constantly escapes from the mixture. In this case the water is imbibed by the membrane more readily than the alcohol, and is dissipated by evaporation.

"Another and more conclusive fact is mentioned by Berzelius; a saline solution filtering through a long tube filled with sand runs out more or less, completely deprived of salt. I have confirmed this experiment by using a tube of about 8 metres [about 26 feet] long, filled with sand, and I have found that the density of the liquid, introduced by the upper aperture of the tube, was to that of the liquid escaping from the other end, as 1 : 0·91. But it is necessary to state that this difference of density was not always maintained; after a certain time, the saline solution is as dense at its exit from the tube as at its entrance. This proves that the decomposition of the saline solution takes place in the first action of contact between it and the particles of sand.

"I have obtained an inverse result by employing a solution of carbonate of soda, which I caused to pass through a tube 3 metres [nearly 10 feet] long, filled with sand. The density of the liquid at its exit was to that at its entrance as 1·005 : 1.

"The phenomena we have just referred to are very important on account of the applications that can be made of them to some of the functions of living beings which are not completely explicable by the mere action of capillarity and molecular attraction."—(Pp. 30–32.)

Lecture III. treats of *endosmose*, a phenomenon which, though exclusively within the domain of physics, is, nevertheless, intimately connected with the study of organized beings, by the physiological applications of which it is susceptible.*

Dutrochet, and Poisson, and Becquerel, have endeavoured to give an explanation of the phenomena of endosmose, but Professor Matteucci remarks, that

"Up to the present time we have not any satisfactory theory of endosmose; but we know that the general conditions of the phenomena are as follow:—1st. That the two liquids should have an affinity for the interposed membrane. 2dly. That the two liquids should have an affinity for each other, and be miscible. If one of these conditions be wanting, endosmose does not take place. Experiment proves that the current of endosmose is not produced by the least dense liquids, nor by the most viscid one, nor by that which is endowed with the greatest force of ascent in capillary tubes. The current is in general determined by the liquid which has the greatest affinity for the interposed substance, and by which it is imbibed with the greatest rapidity. In fact it is evident that the membrane im-

* Dr. Pereira, in a note, claims priority for both Mr. Porrett, of London, and M. Parot, of St. Petersburgh, in the discovery of the phenomenon of Endosmose. Dutrochet's first memoir was read to the *Académie Royale des Sciences*, on the 23d of July, 1827, whilst Mr. Porrett had communicated to the editor of the *Annals of Philosophy* (vol. viii., July, 1816), a paper on two "*curious galvanic experiments*," one of which was the production of endosmose between two liquids separated by a membrane, and subjected to the action of voltaic electricity. He called the phenomenon *electro-filtration*; and asks, whether jointly with electro-chemical action, it is not "in constant operation in the minute pores and vessels of the animal system." In 1844, M. Parot communicated to the *Académie Royale des Sciences*, an inaugural dissertation, published in 1803, giving an account of the phenomena presented by two liquids of unequal density, separated by a permeable organic diaphragm, and pointing out their application to physiology and pathology.

bibes the two liquids unequally; and that the one which is imbibed with the greatest facility, ought to mix with, and augment the volume of the other."—(p. 39.)

Dutrochet found that the slightest trace of sulphuretted hydrogen destroyed endosmose; but Matteucci thinks, however, that this effect arises from the alteration of the structure of the membrane when it commences to evolve gas; for he found fresh membrane placed in contact with sulphuretted hydrogen to be very active. Dutrochet endeavoured to measure the velocity with which a liquid passes, by virtue of endosmose, from the exterior to the interior of the endosmometer; and it was made evident that the velocity of endosmose is proportional to the excess of density of the interior liquid, over that of the water employed as the exterior liquid. Among the curious facts discovered by Dutrochet, was that of the variation in the direction of the current between certain acid solutions and water, according to their density and temperature.

"This is especially manifested by a solution of hydrochloric acid. Thus, with hydrochloric acid at the density of 1·02, endosmose takes place from the water to the acid, whilst at the density of 1·015, the current is in the opposite direction; that is to say, it is from the acid to the water."—(p. 37.)

The phenomenon of endosmose is perhaps one of the most important physical facts applicable to the functions of living beings; yet hitherto very few investigations have been undertaken with the view of connecting it with physiology.

"To do this it was necessary to vary the liquids between which endosmose takes place, and to select the membranes, so that we might always keep as close as possible to the conditions under which the analogies between this phenomenon and those which exist in the interior of living bodies, have been observed."–(p. 41.)

To effect this inquiry, Professors Matteucci and Cima undertook a number of experiments, the results of which are highly interesting and important. The membranes which were submitted to experiment were, 1st, the skin of the frog, the torpedo, and the eel; 2d, the stomach of the lamb, the cat and the dog, and the gizzard of the fowl; and 3d, the bladder of the ox, and of the pig. The first series comprehended the experiments with the cutaneous membrane, and it was in these that the marked influence exercised upon the phenomenon of endosmose by the position of the interposed membrane, was first noticed.

"By employing the skin of the torpedo, placed in one endosmometer with its external surface towards the interior of the instrument, and in the other reversely, and by filling the two endosmometers with a solution of gum Arabic, we observed that, whilst the liquid in the first instrument rose 30 millimetres, it rose in the second sometimes 18, and sometimes only 6 millimetres. In certain cases we saw the liquid elevated 20 millimetres or more, in the first tube, whilst it scarcely rose at all in the second.

"These differences are equally observed with a solution of sugar. Thus, this liquid which rises 30 and even 80 millimetres when the external surface of the skin is turned towards the instrument where the liquid is contained, rises at the utmost only 2 millimetres when the membrane is placed in the contrary direction. In one case where the first-named arrangement was adopted, the liquid rose 80 millimetres; but reached only 30 millimetres when the second arrangement was resorted to.

"With albuminous solutions the elevation was 26 millimetres when the external surface of the skin was in contact with it, and 13 millimetres when placed in the contrary direction."—(pp. 44, 45.)

The results obtained with the skin of the frog agreed in general with

those furnished by the skin of the torpedo. In the case of the eel-skin, the elevation of the liquid was for a time alike, whichever side of the membrane was turned towards the solution of sugar; but after a lapse of two hours, in the endosmometer in which the external surface of the skin was in contact with the solution of sugar, the elevation was 30 millimetres, while in the other instrument it was only 20 millimetres. With a solution of albumen or gum water, the differences were observed from the commencement.

"By employing water and alcohol, Dutrochet obtained the current in the direction from the former to the latter. This consequently formed an exception to all the other cases, in which he found that the direction of the current was from the least to the most dense liquid. The influence of the position of the skin, employed as the membrane interposed between these two liquids, has been rendered evident by our experiments; but the position favourable to the current, which is constantly from the water towards the alcohol, is not the same for the three kinds of skins alluded to. Thus, when we use the skin of the frog, the current is promoted from the external to the internal surface, by being directed always from the water to the alcohol. In various and frequently repeated experiments, we have observed an elevation of 20, 24, and 40 millimetres when the internal surface of the skin was placed towards the alcohol, whilst in the reverse position the corresponding elevations were only 4, 12, and 20 millimetres. Under analogous circumstances, the position of the membrane being favourable, the elevation was 28 millimetres; in the other position, on the contrary, there was no elevation. With the skin of the eel the reverse takes place. With this the current is favoured from the internal to the external surface: and whilst the alcohol contained in the instrument rises to the height of 20 millimetres, when in contact with the external surface of the skin, it only rises to 10 millimetres when the position is reversed. This difference of elevation always takes place in the same direction, and is confirmed for the eel-skin, as for the skin of the torpedo. The elevation has been at 50 millimetres in one instrument, and 20 in the other."—(pp. 47, 48.)

In the second series, the mucous membrane of the stomach of the lamb, the dog, and the cat, and the gizzard of the fowl was employed. The stomachs were taken from these animals immediately after death. The cutaneous membranes exhibited similar differences. When alcohol was employed for the inner liquid, and put successively in contact with each of the surfaces of these membranes, the differences were most remarkable.

"With the stomachs of the lamb, the cat, and the dog, endosmose was invariably directed from the water to alcohol, and was promoted from the internal to the external surface of the membrane. Indeed, we have seen in the endosmometer where the external surface of the mucous membrane of the stomach of the lamb was turned towards the interior of the instrument which contained alcohol, the elevation attained 88 millimetres, and only 10 millimetres in the contrary position; afterwards the liquid in the first endosmometer rose 40 other millimetres, and remained stationary, and sometimes even fell in the second instrument.

"With the stomach of the cat, alcohol rose 22 millimetres in the tube in two hours, when the external surface of the membrane was turned towards the interior of the endosmometer, but with a contrary arrangement it did not rise more than 2 millimetres. Sometimes even when, in the first position of the membrane, the elevation was from 20 to 24 millimetres, in the second there was no elevation. With the stomach of the dog, the elevation of alcohol in the tube was 24 millimetres when the mucous surface was in contact with water, but was only 16 millimetres when placed in the reverse position. Six hours after, the liquid rose again 40 other millimetres in the first case, and 25 millimetres only in the second one. In another experiment, after the time mentioned, the elevations were 130 millimetres and 6 millimetres. With the stomachs which we have hitherto employed, endosmose, which is promoted from the internal to the external surface of the membrane, always takes place from water to alcohol, as in Dutrochet's experiments. It is remarkable that, with the internal membrane of the gizzard of

the fowl, endosmose takes place in the contrary way, namely, from alcohol to water; and this holds good whatever be the position of the membrane with respect to the two liquids. This exception, which we at first attributed to some defect in the membrane employed, we have repeatedly verified, sometimes by introducing, as usual, the alcohol into the interior of the instrument, in which case we have seen the alcohol fall below the level, and sometimes by placing it externally, when the water constantly mounted in the tube. The influence of the position of the membrane is equally evident in this case. We shall commence by giving the diminutions of height marked in the case where the alcohol was in the interior of the instrument. When the internal surface of the mucous membrane was towards the interior of the endosmometer, the diminution of the height of the alcohol was from 24 to 28, and even more than this, in the space of six hours, whilst it was only 11 and 12 millimetres in the other position. In another experiment, which we have selected out of a very large number, the pure water being placed in the interior of the instrument, the elevation was 32 millimetres when the external surface of the membrane was towards the interior of the endosmometer, and 16 millimetres in the other position, in about the space of three hours. Consequently endosmose between alcohol is promoted from the internal surface to the external surface of the gizzard of the fowl."—(pp. 58, 59, 60)

In the third series the mucous membrane of the bladder of the ox, in a fresh state, was employed. The height which a solution of sugar attained

"Was, when the internal surface of the membrane was in contact with the saccharine liquid, 80, and even 113, millimetres in the space of two hours; but it was only 63, or 72, millimetres when the position of the membrane was reversed. The current of endosmose, therefore, is promoted in this instance from the external to the internal surface of the membrane. The contrary effect is obtained with a solution of gum Arabic. The elevation is 18, and sometimes only 7, millimetres, when the internal surface is turned towards the interior of the instrument containing the gum solution; whereas, when the membrane is arranged the reverse way, the elevation is 52 millimetres, or, in some cases, 20 millimetres."—(p. 61.)

With the gummy solution, the liquid sometimes first fell in both tubes, and after some time, rose to nearly the same heights as those observed with the saccharine liquid. With an albuminous solution and pure water, no endosmose took place; the liquid falling in both tubes, whether the interior of the instrument contained the albuminous solution or pure water.

"Yet it should be mentioned, that when the inner surface of the membrane is in contact with the albuminous solution placed outside the instrument, the diminution of height is less than when the position is reversed; and that the contrary takes place when this solution is in contact with the external surface of the membrane. Lastly, with alcohol and pure water there is endosmose from the water to the alcohol, as in most cases; but the elevation is sometimes 24 millimetres, sometimes 59 millimetres, when the external surface of the membrane is in contact with the alcohol, and sometimes 26, or 37, millimetres in the reverse arrangement."—(pp. 61, 62.)

These phenomena were all more or less modified when the membrane used had undergone more or less the putrefactive process; thus demonstrating the intimate relation existing between the phenomenon of endosmose and the physiological condition of the membranes.

"The phenomenon of endosmose, like everything going on in organized tissues, is devoid of that constancy and regularity observed in physical phenomena elsewhere. To this variable and accidental organic condition of the fresh membranes must be ascribed the singular fact, that while in certain cases we obtain an elevation of perhaps 80 millimetres, yet sometimes with the same liquid, the same membrane, and in the same relative position, the rise does not exceed 10 millimetres. We must also ascribe to a constant anatomico-physiological condition, connected with the function of the same membrane, that constant difference of

elevation in the two different positions of the membrane, whatever this difference may in other respects be. It is important to study the phenomenon with the view of recognizing the accidental circumstances which cause the variation of endosmose through the fresh membranes; as, for example, the privation of nourishment in relation to the stomach, the administration of certain substances to the animal before killing it, &c."—(p. 64–65.)

On the subject of *exosmose*, Professor Matteucci observes:—

"That in ascribing everything to endosmose, the presence of the solution of gum, or of sugar, in the interior of the endosmometer, gives us no explanation of the phenomena which are observed with the internal membrane of the stomach of the lamb, and with the mucous membrane of the bladder of the ox; and that these phenomena are susceptible of a more easy and natural explanation, by assuming that, by exosmose, the various membranes give to the different liquids a more or less easy passage towards the water, according to the surface with which these liquids are in contact; and by supposing that the passage of the water towards the denser liquid is always constant, in accordance with the almost general law of endosmose."—(p. 67.)

But to ascertain the correctness of these views, it was necessary to resort to experiment, and not only to prove the existence of exosmose, but also, to measure it in the same manner as exosmose. A number of interesting experiments were undertaken, and their results are given. When equal volumes of salt water of known density was introduced in two endosmometers, in one of which the internal surface of the skin of the eel or frog was placed towards the interior of the vessel, and in the other, was in the contrary position, were plunged into two vessels of distilled water of the same volume as the salt water, it was

"Observed that endosmose from water to a saline solution through these skins, was most promoted from the internal to the external surface. By determining the density of the liquids contained in the two vessels, we found that in the endosmometer, *in which the volume of salt water was most increased, the density of the liquid was preserved better than in the other; and* vice versâ, *in the vessel in which the diminution of distilled water was greatest, the quantity of the saline solution introduced by exosmose was less than in the other vessel from which a smaller volume of distilled water had disappeared.*"—(p. 68.)

A similar result was observed with the solution of sugar and the skin of the eel.

"These facts cannot be explained by assuming that the elevation and increase of volume of the liquid of the two endosmometers arise merely from the difference between the current of endosmose and that of exosmose. If it were so, the endosmometer in which the largest quantity of saline solution had accumulated, ought to contain a liquid less dense than that in the other which presented a less augmentation of volume. These facts may be, on the contrary, completely explained, by assuming that the current of endosmose has been equal, or nearly so, in the two positions of the membrane, and that the difference depends altogether in the current of exosmose, which is weakest in that endosmometer in which the elevation is most considerable, and stronger in the one in which the elevation is the slightest. These results give a great importance to the influence of the membrane interposed between the two liquids in the phenomenon of endosmose; for, by its particular nature alone and its physiological function, we can explain the more or less easy passage of different denser liquids towards other less dense ones through the membrane itself."—(pp. 70, 71)

In all the skins experimented on, the exosmose of solutions of sugar, albumen and gum, towards water, is promoted from the internal to the external surface.

"It is precisely in this same direction through the skin of the torpedo, the eel,

the frog, and other animals, that a copious secretion of mucus takes place. The endosmose of water to a solution of sugar, of gum, and of albumen, is less intense from the external to the internal surface of the skin than when it takes place by the reverse arrangement. Consequently, if we do not admit that this secretion of mucus, and this weak absorption of the water wherein these animals live (functions which, for their normal performance, ought always to bear a certain relation to each other), are entirely due to the phenomena we have discovered; at all events, we cannot deny that they must be promoted by it. Undoubtedly this function of the skin would not go on, or would do so imperfectly, if in these animals which live constantly in water, this membrane acted endosmotically in an opposite direction to that which we have found it to do.

"This constancy observed in the direction most favourable for endosmose and exosmose through skins, does not hold good for the mucous membrane of the stomach of different animals. But every one knows how much more complicated the function of the stomach is, and that all the substances introduced into this organ are either not absorbed, or are absorbed unequally. Moreover, we repeat, that this subject requires elucidation by fresh experiments. When we remark that the direction most favourable to endosmose between water and a saccharine solution, for example, is not the same for the stomach of a ruminant as for the stomach of a carnivorous animal; it clearly follows that the phenomenon of endosmose must be intimately connected with the great differences which exist in the digestive functions of these two orders of animals."—(pp. 71, 72.)

The recent experiments of Poiseuille, made with the view of explaining by endosmose the purgative action of certain saline substances, are next referred to. He found that there was endosmose through animal tissues from the serum of the blood to Seidlitz water, and to solutions of the sulphate of soda and common salt. Now this is precisely what happens on the internal administration of these medicines; the excrements contain a large amount of albumen; and we must admit, that endosmose takes place through the capillary vessels of the intestine, from the serum of the blood to the saline solution introduced into the alimentary canal. To substantiate Poiseuille's views, it was necessary to demonstrate that endosmose occurs when one of the liquids is in motion, and is being continually renewed. This has been done by Dr. Bacchetti, who has shown that the rapidity of endosmose is considerably augmented when one of the liquids was constantly renewed. This result is in accordance with the principles of the theory of endosmose; for the constant interchange of the same liquids through the membrane suspends, finally, endosmose. Poiseuille has, also, shown that endosmose ceases to take place in a membrane after a certain time of action; but that the membrane reacquires this property, by submitting it to the action of other liquids.

The influence exercised on endosmose, by the hydrochlorate of morphia, is another remarkable and valuable fact, for which we are indebted to Poiseuille and Bachetti. This salt, when added to saline solutions, weakens considerably the endosmose from the serum to the solution, and ultimately changes the direction of the current.

"How," inquires Professor Matteucci, "can we make an entire abstraction of this fact in the explanation of the action of morphia, and of the preparations of opium in diarrhœa, as well as of the constipation which they produce?"—(p. 74.)

Lecture IV.—Absorption and *exhalation* in animals and plants are considered, the preceding lectures on the phenomena of capillarity, imbibition, and endosmose, having prepared the way for their study. Absorption in animals, consists of two acts—imbibition and transmission; the substance to be absorbed is not only to be introduced through the interstices of an organized body, but it is to pass into the circulation, the final object of the phe-

nomenon. If a frog, whose inferior extremities only have been immersed in a solution of ferrocyanide of potassium, be, after careful washing, cut in pieces, by touching any part with a glass rod, moistened with muriated tincture of iron, a blue stain is produced, proving that the solution has penetrated every part. If a living frog be treated in the same way and then killed, scarcely any traces of the salt can be detected in the muscles of the legs and thighs (the immersed parts), whilst the heart and lungs give distinct evidence of its presence.

"One experiment more, and the conclusion will be evident. I immerse another frog, which has been dead for some minutes, in the same solution, and leave it there for the same time that I did the other. When tested, the lungs and heart offer no greater evidences of the presence of the ferrocyanide than does any other part of the body. Here is the explanation of these experiments:—The solution was introduced into the body of the frog simply by imbibition; and this phenomenon, being effected in the living as well as in the dead frog, certainly cannot be regarded as different from the imbibition which we have already studied, which belongs to both organic and inorganic bodies, and which is the consequence of their cellular and vascular structure, &c. But there is something more than this. In the heart and lungs of a living frog we find a much larger quantity of the absorbed solution than in the other parts of the body, although these latter were much nearer the part immersed. These viscera are the centre of the circulatory system: in them commence or terminate the trunks of the blood-vessels. The solution of the ferrocyanide, therefore, has penetrated the blood-vessels by imbibition, mingled with the blood, and thus arrived at the heart and lungs. We have another very simple experiment proving the same facts:—I take two frogs, and from one remove the heart; the animals are equally lively. Both are placed in a large glass containing a solution of the extract of nux vomica. The animal with the heart is soon poisoned, and long before the other becomes affected."—(pp. 77, 78.)

All vessels absorb; the lymphatics as well as the blood-vessels. That absorption is a physical phenomenon, is not only shown by the conditions under which it takes place, but also by positive experiment. Take a long piece of vein from any large animal, and attach it at one end to a tube in the lower part of the side of a glass bottle filled with water, and tie the other extremity to a small bent glass tube, furnished with a stop-cock; immerse a portion of the vein in water, accidulated with sulphuric or hydrochloric acid. At first the liquid within the bottle gives no indication of the presence of the acid; but if the stop-cock be opened, the liquid which flows out through the veins is acid. After some time the fluid in the bottle is found also to be acidulated. If a tube of clay or of pasteboard, or of wood be substituted, the same happens. If the acidulated solution be contained in the interior of the vein; and if litmus be added to pure water in the basin, the same phenomenon is observed; and the acid will pass out through the coats of the vein, with a facility proportionate to the velocity of the current.

"Suppose for a moment that the direction of the circulation of the blood was inverse to that which it really is, but without any alteration in the structure and disposition of the blood-vessels; we should then no longer say that the veins absorbed, but, on the contrary, that absorption took place by the arteries. Such is the very simple physical phenomenon of this function."—(p. 83.)

The laws of absorption are next very happily illustrated by the application of the principles previously laid down.

The function of *exhalation* is, in general, effected by the same mechanism, and under the same laws as those of absorption. In every vessel capable of imbibition, a portion of the contained liquid is constantly passing out or

exhaling through its coats, in proportion to the greater or less facility with which it is imbibed by the tissue of the vessel, and the greater or less moisture of the sides of the vessel. The exhalation will be augmented if, in consequence of the very large quantity of contained liquid, the walls of the vessel are subjected to increased pressure. Edwards has proved, that cutaneous exhalation is, in some cases, ten times greater in dry than in moist air, and that it is doubled in passing from 32° Fahr. to 68°. He also found that transpiration was augmented by agitating the air around the body of an animal.

"Some of the phenomena of absorption and exhalation in living beings, are accomplished by the transformation of absorbed or exhaled body. The liquid which is imbibed by a membrane, and exhaled from its opposite surface, is not identical with that which was placed in contact with the absorbing membrane. This happens in most of the cases of exhalation, and principally in the secretions. We are very far from expecting to find, in the present condition of physico-chemical knowledge, an explanation of the phenomena of the secretions. We must admit that they form as yet one of the most obscure subjects of the animal economy. With respect to exhalation it may be observed, that in some cases it is effected by a kind of filtration. A liquid which contains in suspension insoluble particles, is separated by filtration into two portions: the liquid part, which is imbibed by the substance of the filter, and is strained; and the solid part, which remains on the filter. Anatomists know that by injecting into the veins or arteries a solution of gelatine coloured by very finely powdered vermilion, the solution becomes colourless when it percolates through the coats of the vessels. Every contusion of the skin produces a spot, the centre of which is of a dark blue, and the circumference of a green colour surrounded by yellow. In this case, the extravasated clot of blood is separated from the serum, which is imbibed by the neighbouring tissues. Do not forget the fact which has been demonstrated to you respecting imbibition. Salt water becomes fresh by traversing a bed of sand; while a solution of carbonate of soda, filtered under the same conditions, becomes denser. Imbibition, capillarity, and the simple play of molecular attraction, can overcome affinities. The old notion, therefore, according to which the secreting organs were considered as mere filtering apparatus, is not entirely without foundation."—(pp. 88, 90.)

The lecture concludes with a sketch of absorption in plants. Prof. Matteucci admits that the movement of the juices of plants is inexplicable by capillarity and imbibition merely.

"The cause resides principally in the roots, and in the next place in the leaves. It is probable that an action of endosmose occurs in the extremity of the roots; and it is not unnatural to suppose that a similar cause acts in the movements of the chyle and lymph in the lymphatic and chyliferous vessels; a movement which continues some time after death."—(p. 96.)

Lecture V. treats of Digestion; it is an able summary of that subject, and contains some original researches of the author on the *absorption of fat*.

"It is difficult to determine precisely by analogies derived from chemistry, what becomes of the fatty substances after they have passed out of the stomach. It is certain that they are there absorbed, and that the chyliferous vessels may be considered as almost exclusively charged with this function. Here are some experiments, by means of which I have endeavoured to diminish the obscurity which hangs over this part of the digestive process. I put into a mattrass a solution of 300 grammes [= 9 oz. 132 grs. troy] of distilled water, $1\frac{3}{10}$ grammes [about 20 grains troy] of caustic potash. This solution has not any perceptible alkaline taste, and acts very feebly on litmus paper; it is a liquid whose alkalinity is about equal to that of the lymph and chyle. By means of a salt water bath, I expose the mattrass to a temperature of from 35° to 40° centig. [= 95° to 104° Fahr.]; I then add some drops of olive oil and shake the mixture: it instantly becomes so milky that it might be mistaken for milk itself. The liquid thus obtained, when left to itself, preserves its analogy to milk, and separates into two layers,

the one more opaque at the top, in which are evidently small globules of fatty matter; the other, below, and less opaque, although still having a milky aspect. I have filled a piece of intestine with this species of emulsion, and plunged it into the alkaline solution already described, whose temperature was maintained at from + 35° to 40° centig. [= 95° to 104° Fahr.] After some time the latter becomes turbid, and acquires the characters of the interior emulsion. We, therefore, presume, that a portion of the emulsion has passed through the membrane and become diffused externally. I may mention to you another experiment which appears to me still more conclusive. I filled an endosmometer with a very weak alkaline solution, and plunged it into the emulsion. The membrane employed was, as usual, ox bladder, and the two liquids were at the temperature of + 30° centig. at the commencement of the experiment. Endosmose took place; the emulsion passed into the alkaline solution; and the liquid rose in the tube to the height of 30 millimeters in a very short time. These physical phenomena, which, although they do not explain all the peculiarities of the digestion of fatty substances, nevertheless contribute to render them less obscure. The chyliferous vessels, which terminate in closed or blind extremities (*en cul-de-sac*), and are enveloped by intestinal mucus, are, especially in a fasting animal, filled with an alkaline liquid, very analogous to lymph. After digestion, particularly when the animal has been fed on fatty substances, the liquid of the chyliferous vessels differs from what it was previously, merely by the addition of fatty corpuscles, which give it the milky appearance. It is natural to suppose, that this chemical affinity, which produces the milky liquid in the mixture of the alkaline solution and oil, is also exerted through the membrane of the chyliferous vessels, which certainly imbibes as much of the alkaline solution as of the milky liquid, formed by the action of the alkali on the fatty bodies. The phenomena of endosmose, of which I have spoken, may also be admitted, with great probability, as one of the causes which produce absorption by the chyliferous vessels. It is certain, that absorption could not take place, if the inner sides of the intestines were not bathed with some liquid, for which the fatty bodies had some affinity. It is easy to demonstrate, by experiments, that the alkaline condition of the intestinal coats favours this absorption. Fill two funnels with sand, equally shaken down in each. Pour into one, pure water, into the other, an alkaline solution; when the liquids have filtered through, pour an equal quantity of oil on each filter. For several hours the oil will remain upon the surface of the sand, which has been moistened with pure water; whilst in the other funnel, in which the sand has been moistened with the alkaline solution, the oil will rapidly disappear by imbibition. The neutral azotized substances which pass into the blood, after having been dissolved by the gastric juice, would rapidly destroy the neutral or slightly alkaline condition necessary to the preservation of the qualities of the blood; but the alkali of the chyle, of the lymph, of the bile, and of the pancreatic fluid, preserve the neutrality of it."—(pp. 111, 112, 113.)

Lectures VI. and VII., devoted to the consideration of ***respiration***, ***sanguification***, ***nutrition***, and ***animal heat***, contain much that is interesting and important, though but few original observations, and need not, therefore, detain us, as our object is chiefly to present to the reader the original researches of Prof. Matteucci himself.

Lecture VIII., on the Phosphorescence of Organized Beings, contains some highly interesting observations on the *Lampyris Italica* or *Italian glow-worm*, the last two segments of whose body, which by day appear yellowish, are slightly luminous in the dusk, and during the night evolve a bright intermittent light. This yellowish matter continues to emit light when separated from the body of the animal. The following are some of the conclusions which Prof. Matteucci arrived at in studying the phosphorescence of the glow-worm.

"1st. The phosphorescence of the glow-worm may cease, without the insect being dead.

"2d. There exists in this insect a matter which evolves light, without any ap-

preciable heat; and the animal to manifest this property, does not necessarily require either to be entire, or to possess life.

"3d. Carbonic acid and hydrogen form a medium in which the phosphorescent matter of the glow-worm ceases to shine after an interval of time, not exceeding thirty or forty minutes, provided that the gases are pure.

"4th. In oxygen gas, the brilliancy of the phosphorescent matter is considerably greater than in atmospheric air, and the duration of the phosphorescence is nearly three times as long. This holds good with regard to the luminous segments only, as well as with the entire animal.

"5th. This phosphorescent matter, placed under conditions suitable for the emission of light, absorbs a portion of oxygen, which is replaced by an equal volume of carbonic acid.

"6th. This same substance, when deprived of its faculty of glowing, and then placed in contact with oxygen gas, no longer absorbs oxygen, or produces carbonic acid.

"7th. Oxygen mixed with either hydrogen or carbonic acid, in the proportion of 1 to 9, forms a medium in which the phosphorescence continues for several hours. We may, therefore, conclude, that it is in consequence of some alteration in the phosphorescent matter, that this ceases to glow after it has been for some days in pure oxygen, one portion only of which has been replaced by carbonic acid.

"I examined the hydrogen, in which I had kept several glow-worms for the space of twenty-four hours, and in which they had glowed for a few minutes only. The following is the result obtained when the gas was pure, and the experiment was conducted over mercury; the bell-glass being carefully filled by inverting it two or three times, in order to get rid of all the air adhering to the glow-worms: the volume of the gas was slightly augmented: with 8 cubic centimetres of hydrogen, I obtained an excess of 0·2 cubic centim. which was absorbed by potash. Thus, then, the insects produce carbonic acid, which must either be formed by the union of carbon with the oxygen remaining in the tracheæ, or exist ready formed in the animals. When the luminous segments alone are placed in hydrogen, with due precaution, they glow for a few seconds only and the gas is not altered.

"8th. Heat, within certain limits, augments the light of the phosphorescent matter; cold has a reverse effect.

"9th. When the heat is too strong, the phosphorescent matter becomes altered, as it also does when placed in the air or in any gas whatever for a certain length of time. This undoubtedly is the reason why these insects cannot live in all climates, and why they shine only during certain months of the year.

"10th. The phosphorescent matter, when thus altered, is no longer capable of emitting light or of becoming luminous.

"These conclusions evidently prove the nature of the phenomenon: the production of light, by this insect, is essentially connected with the combination of oxygon with carbon, which is one of the elements of the phosphorescent matter." (pp. 174, 175, 176.)

Prof. Matteucci examined the structure of the luminous organ with the microscope. He found

"On the removal of the luminous segments of the dorsal and abdominal membranes, there was perceived a yellowish, granular, globuliform matter, in which appeared groups of red globules, a great number of ramifications, and, moreover, a species of tubes which had the appearance of muscular fibre, but which, when closely examined, appeared hollow. By looking at them at night, the light was seen to be emitted by the granular yellow matter; and when we compressed this between two glasses, the light was always observed on the edges of the examined portion. The abdominal membrane examined alone, after it has been washed several times in water in order to remove from it all the phosphorescent matter, is transparent, and furnished with a great number of hairs. The dorsal membrane, less transparent than the former, is likewise hairy, but it is also supplied, on its internal surface, with many tubes or tracheæ, which penetrate the phosphorescent matter. I must further add, that I never separated the abdomen of a glow-worm without finding under the last luminous ring but one, a bright red vesicle, which,

viewed by the microscope, is found to be made up of a group of red globules. I have never met with this vesicle in other insects of the same genus, and no work on comparative anatomy mentions it. In my ignorance of this science I content myself with announcing to zoologists the presence of this body."—(pp. 180, 181.)

The phosphorescent matter, taken from a living animal, has a remarkable odour, resembling that of the sweat of the feet. It is neither acid nor alkaline; dries readily in the air; appears to coagulate on contact with diluted acids; does not dissolve either in alcohol or ether, or in weak alkaline solutions.

"It dissolves and becomes changed, in hot concentrated hydrochloric and sulphuric acids. By the employment of the last-mentioned acid, the solution does not become blue, which fact excludes the idea of the presence of albumen. Heated in a tube, it gives out the usual ammoniacal products. It does not present any obvious trace of phosphorus; of this fact I have assured myself, by calcining this matter several times with nitre in a platinum crucible, and by treating the dissolved residue with the tests which indicate the presence of the phosphates. From all that we have now stated, we can no longer regard the presence of phosphorus as the cause of the light in these insects. Perhaps by operating on a large number, we might succeed in discovering a slight trace of phosphorus, which is usually found in all organized substances. From all these experiments, I conclude that carbonic acid is produced by the contact with oxygen of the phosphorescent matter alone, separated from the rest of the animal; that the light ceases to be produced when this gas is not present, and that by the contact of the latter, light and a volume of carbonic acid, equal to that of the oxygen consumed, are produced; and that the phosphorescent substance of this insect, when not luminous, does not act on oxygen. It is, therefore, natural to suppose, that in the luminous segments of these animals, enveloped by transparent membranes, and by means of the numerous tracheæ discovered here and there in these animals, atmospheric oxygen is brought in contact with a substance, *sui generis*, principally composed of carbon, hydrogen, oxygen, and azote. The presence of a great number of dispersed blood-globules intermixed with the granular luminous matter, proves that these segments are the centre of a peculiar organ of secretion; and I believe that this red vesicle, which I have described as existing above the luminous segments, merits the attention of naturalists."—(pp. 182, 183.)

Lecture IX. treats of the *electrical current of muscles.* Prof. Matteucci, as most of our readers are no doubt aware, has devoted much zeal and labour to the investigation of animal electricity, and to the results of those investigations he owes much of his present celebrity.

Amongst the chemical actions of living beings, we have not only heat and light, but also electricity; and the existence of an electrical current is readily proved, when in connecting, by means of a conducting body, two different parts of the same muscular mass of a living or recently killed animal. The indicator or galvanoscope used by Prof. Matteucci is the leg of a frog, to which is attached the crural nerve and lumbar plexus; the muscles of the thigh having been carefully removed. The leg thus prepared is introduced into a glass tube, covered with an insulating varnish; the nervous filament projecting. With this instrument we can conduct our researches on the electric current. For, on applying one extremity of the nerve to the bottom of the wound, and another portion of the nerve to the lips of the wound, or, better still, to the external surface of the muscle, the frog's leg continually contracts; thus demonstrating the presence of an electrical current, which circulates in the nerve, since it is necessary to form a circuit, of which the nerve is a part. This phenomenon takes place in all animals warm or cold blooded. Our author has recently proved that the galvanoscopic frog exhibits the same signs when we operate on a wound made in the human muscle. If the nerve of the frog, or different portions

of the muscle, be moistened with a saline or acid solution, or, still better, with an alkaline one, the contractions of the frog's leg are more energetic.

Contractions are also produced in the frog when we bring the nerve in contact with a muscle separated from the animal. The direction of the current is demonstrated to be invariably from the internal part to the surface of the muscle. To study better the fundamental laws of the electrical current, Prof. Matteucci constructed with the demi-thighs of frogs a *muscular pile*, one extremity of which was formed by the external surface of the muscle, and the other by the internal. Two cups were filled with a weak saline solution, and the two extremities of the galvanometer were plunged into them, and a deviation of the needle was immediately observed. The muscles of other animals, of fishes, birds, or mammals, may be substituted for those of the frog; and, provided that the relative position of the muscular elements be such as just indicated,—the internal surface of the muscle next to the external—more or less deviation of the needle of the galvanometer will be obtained. The intensity of the current is in proportion to the number of demi-thighs employed to form the pile. Prof. Matteucci endeavoured to ascertain whether the other tissues and organs of animals,—the membranes, the nerves, the brain, the liver, and the lungs,—denoted the presence of an electric current; but he invariably obtained very feeble signs of it. The heart alone gave indications of a very strong current. This property does not depend on the nervous system, for if the nerves which supply the muscles be destroyed, the latter do not lose their property of manifesting the electrical current. The origin of this current resides in the electric conditions, which are produced by the chemical actions of the nutrition of the muscle. The blood charged with oxygen, and the muscular fibre, which becomes transformed on contact with this liquid, compose the elements of a pile: they are the liquid acid and zinc.

"In the normal condition of the muscle, there can only be molecular currents produced by the formation and destruction of opposite electrical conditions in the same points; but if a great number of points of the muscular fibre be put, by means of a good conductor, in communication with others of a different nature, which do not suffer the same chemical action on the part of the blood, the electric current should then circulate. It is this fact, furnished to us by experiment, which proves at the same time the development of electricity in the living muscle, and the impossibility for the electric current to circulate in the masses of this muscle in the natural condition."—(pp. 200, 201.)

The influence of the organic condition of the muscle is considerable. The current is less intense in the muscles of animals which have been kept without food, or in which the blood circulates feebly, or has ceased to circulate. On the contrary, in muscles, which have been for some time the seat of inflammation, or have been gorged with blood, or belong to animals that have been well fed, the muscular current shows more intensity, and continues for a longer period. The intensity of the current was not affected in frogs poisoned by carbonic acid, hydrocyanic acid, and arseniuretted hydrogen. The influence of sulphuretted hydrogen is, on the contrary, very marked; a dead animal, in an atmosphere of sulphuretted hydrogen, almost entirely loses the property.

Lecture X. on *Electric Fishes*, and the *Proper Current of the Frog*; and *Lecture XI.* on the *Physiological Action of Gravity, Light* and *Caloric*, which contains nothing new, we shall pass over. *Lectures XII. and XIII.* treat of the *Physiological Action of the Electric Current.*

Statical electricity produces no phenomenon on living beings peculiar to

them, or different from those offered by inorganic bodies when submitted to the same influence. Such is not the case, however, with respect to the action of dynamical electricity. The assumption of Galvani of the existence of an *animal electricity*, which the metallic arc merely discharged, though abandoned after Volta's experiments with the condensing electrometer, is now regarded as far from erroneous. But the contractions excited in the frog, or in any living or recently killed animal, when one of its nerves is traversed by the electric current, are quite independent of all animal electricity. If you expose the sciatic nerve in both thighs of a rabbit, separating it as much as possible from the surrounding parts, then wipe it with some unsized paper, and introduce beneath it a band of gummed taffeta to insulate it completely from the surrounding parts, and then transmit the current from a pile of ten elements along the nerve, at the moment the circle is closed, the muscles of the thigh will contract, the animal will utter cries, and the ears be agitated. These effects are repeated when the circuit is opened, by interrupting the communication of the conductors with the nerve. This phenomenon occurs whether the direction of the current be direct or inverse. Whilst the circuit remains closed no effect is perceived.

"Whatever be the direction of the current in the nerves, it gives rise, both at its commencement and at its interruption, to analogous phenomena; but we constantly observe, that the most violent contractions are those which are excited during the first moments of the passage of the direct current. Marianini observed, that if a man close the circuit of a pile composed of a certain number of elements, by touching one pole with one hand, and the opposite pole with the other hand, the strongest shock is always felt in that arm in which the direct current circulates.

"If we continue to experiment upon the same animal, all these phenomena more or less rapidly cease, according to the greater or less energy of the current, and the animal gives no further evidence of the passage of it. If the animal be then left undisturbed for some time, or, if we augment the force of the battery, the previous phenomena reappear.

"But it is important to follow carefully the phenomena which take place in proportion as the action of the current upon the animal is prolonged, and before they completely cease. You will observe that, when the direct current is interrupted, the contractions of the inferior muscles (those which are placed below that part of the nerve to which it is applied) become more feeble, whereas they continue in the muscles of the back, and the agitation, and often the cries, of the animal continue. We see, also, that for the first few moments of the passage of the current, its effects are limited to contractions of the inferior muscles. When the current is reversed, the contractions of the muscles of the back, the movements of the ears, and the cries, are not manifested except at the moment of closing the circuit; while the contractions of the inferior muscles are scarcely perceptible. But the opposite effect takes place when we interrupt the circuit: that is to say, the contractions of these latter mucles continue, whilst those of the back, and the movements of the ears disappear, and the animal ceases to utter cries." —(pp. 246, 247.)

We must, therefore, divide into two different periods the action of the electric current on the nerves of a living animal. The current acts in the direction in which it is transmitted, when it begins to circulate in the nerve, and in the opposite direction when it ceases to circulate. If you divide transversely the spinal marrow of a rabbit, and pass an electric current along the crural nerve, the muscles situated below the point of division only contract; and if the division was effected near its inferior extremity, no contractions will occur in the muscles situated above the excited nerve.

"The contractions excited in the muscles situated above the irritated nerve by an electric current, are then *reflex movements*. The excitation of this nerve is transmitted to the spinal marrow, and the latter, by a reflected action, produces contractions of muscles not supplied by the nerve irritated by the current. We may, therefore, say, in the language of Dr. Marshal Hall and other modern physiologists, that the electric excitation of a nerve which was at first centripetal, is transformed into a centrifugal one." * *

"By submitting recently killed rabbits, prepared as in the preceding experiments, to the influence of a single element, we obtain the contraction of the inferior muscles, at the moment when the circuit of the direct current is closed, and when that of the inverse current is interrupted. By acting with a more powerful battery, the contractions of the same muscles take place as well when the current begins to circulate as when it ceases, whichever its direction may be. After it has continued to pass for a certain time, contractions no longer ensue, except at the commencement of the direct, or at the cessation of the inverse current."—(p. 249.)

These phenomena may be verified by preparing a frog according to Galvani's method, and from which the bones of the pelvis, and the lumbar vertebra have been removed. The frog is so placed that each foot shall be in a glass of water.

"When I plunge the two conductors of a pile into these glasses, you will at first observe that the frog will leap out; and if we retain it forcibly in its place, contractions take place in both legs both when opening and closing the circuit, and, consequently, in the limb in which the current is direct, as well as in that in which it is inverse. But if we continue the experiment, we soon perceive the alteration already described; that is to say, at the moment when the circuit is completed, one limb only contracts, namely, that in which the current is direct; while, on the contrary, when we interrupt the circuit, the contraction takes place in the other limb, namely, in the one traversed by the inverse current. This series of phenomena is manifested, more or less speedily, according to the strength of the current, and the vivacity of the animal, but it is never absent. Thus, then, the frog is not only a galvanoscope of extreme sensibility, but it is also an instrument which may perform the office of a galvanometer, and like this, indicate the direction of the current which circulates in a portion of its nerves." —(pp. 250, 251.)

Professor Matteucci next examined the action of the electrical current on muscular fibre alone, by depriving a muscle as carefully as possible of its nervous filaments; and he found that it excited contractions of the muscular mass, both when the circuit is closed and when it is interrupted, whatever may be the direction of the current relatively to that of the muscular fibres; and, also, that the contractions which take place when the circuit is opened, are the first to disappear.

"If the discharge be that of a Leyden bottle, which is made to pass across a muscle,—for example, the gastrocnemius of a frog,—it is curious to observe that the muscle contracts and continues in that state."—(p. 253.)

It remains now to notice the various circumstances which modify the action of the current on the nerves and muscles of living, or recently killed animals.

"The *voltaic alternatives*, of which I am now about to speak, are the result of the same passage of the current in the nerve. Observe in what this phenomenon consists. We put a frog, prepared in the usual way, across two small glasses, containing pure, or slightly saline water, in such a way that the spinal marrow is immersed in one glass, and the legs in the other. We then close the circuit. If we allow the current to circulate for a certain time, say twenty or thirty minutes, according to the strength of the current, and then open it and close it again, no further contractions are obtained. But by reversing the direction of the current, the contractions re-appear; and they cease again, more speedily than in the pre-

ceding one, when the passage of the current has been prolonged. By again reversing the direction of the current, that is, by re-establishing it as it was at the commencement of the experiment, the contractions reappear. These alternations may be repeated a certain number of times on the same animal. The intervals of time between the passage of the two currents, depend on the intensity of the current and the vivacity of the animal. It is easy to prove that the diminution of the excitability of the nerve from the passage of the current, is principally manifested in the portion traversed by the latter. Suppose we have passed a current through the nerve of a frog prepared after Galvani's method, and have prolonged the action until the contractions have ceased; if we then apply the conductors to a portion of the nerve more distant from the brain than that on which we first acted, we soon observe the contractions re-appear according to the laws already laid down. By continuing these experiments, exposing successive portions of the nerve more distant from the brain, similar results are obtained. We may therefore say, that the excitability of the nerve, roused by the current, retires towards the periphery according as its vitality becomes extinct. When we act on a living animal in the way described, we find that the signs of pain evinced when an electric current traverses its nerves, are also manifested when we act on those parts of the latter, nearer and nearer to the brain, according as its vivacity diminishes by the prolonged passage of the current. In both cases, it is the excitability of the nerve which becomes weakened by the passage of the current; and, as when a muscular mass is traversed by the latter, it is certain that the whole, or at least the greater part of the current passes, not by nervous filaments, but by the muscles, which are better conductors, it is natural that these filaments should preserve their excitability, and that they should be found also excitable by the current."—(pp. 253, 254, 255.)

Animals killed by hydrogen, azote, carbonic acid, and chlorine, present no difference, when the electric current is passed through their nerves, from animals dead of or from other causes. But when they are destroyed by hydrocyanic acid, or by the repeated discharges of a large battery through the spinal marrow, very slight or no contraction is produced, when the current is applied upon the nerves; but when the muscles are submitted to the same current they give evident signs of contraction; thus proving that the muscular fibre possesses the property of contracting under the influence of the electric current, independently of the nerve. But in animals who have died in sulphuretted hydrogen, no contractions are obtained, unless powerful currents are employed, and then they soon cease, whether we act on the nerves, or on the muscles. A ligature on the nerve produces no other influence than that of insulating the effects of the current; that is, of producing the effects of its action on the nervous centres, separately from those which it has when acting upon the extremities of nerves. For when the current is transmitted through the part above the ligature,—towards the brain,—on opening and closing the circuit, signs of pain and contractions of the back are manifested; but if the current be transmitted below the ligature, contractions of the leg are obtained.

Prof. Matteucci experimented to ascertain the different effects of the direct and inverse current. The general conclusions at which he arrives, are:—

1st. "The contraction excited by the electric current, transmitted along a nerve in the direction of its ramification, and which we call *direct*, is always more energetic than that which this same current produces when passing along the nerve in the opposite direction.

2dly. "The direct current weakens and rapidly destroys the excitability of a nerve; whilst the passage of the inverse current augments it within certain limits.

3dly. "To produce these effects, the action on the nerve, of the direct as well as of the inverse current, ought to be continued for a certain time, which will be longer in proportion as the excitability of the nerve is weaker."—(p. 262.)

He next notices the influence produced by repose on a nerve which has been submitted to the action of the current.

"If the nerve has been traversed by the direct current, repose restores a portion of its excitability; if it has been traversed by the inverse current, it loses by repose a part of that excitability which it had acquired under the influence of the current. When the nerve is very irritable, a very short repose suffices to restore the excitability lost by the action of the direct current; it is the same with the augmentation occasioned by the inverse current; almost as soon as it is interrupted, the nerve returns to its normal condition. In proportion as the excitability diminishes, the duration of repose necessary for giving or arousing the excitability acquired under the passage of the current, augments."—(pp. 263–4.)

The theory of the action of the current on the nerves, and of the phenomena which it produces in animals, deduced from the foregoing facts, established by innumerable experiments, which Prof. Matteucci gives, as well as the effects of the currents on the brain, spinal marrow, roots of the nerves, nerves of sensation, and ganglionic nerves, we shall be obliged to pass over. Our author found, along with Marianini and Masson, that a repeatedly interrupted current destroyed the excitability of the nerves much more quickly than a continuous one. He describes and figures Masson's apparatus, which is highly ingenious. On submitting a rabbit to the passage of a current by means of Masson's wheel, one of the conductors of a pile of ten elements being introduced into the mouth, and the other communicating with the muscles of the back, the animal died within a few seconds; so great was the loss of nervous power in a very brief space of time.

Prof. Matteucci concludes these lectures with stating some of the therapeutical applications made of electric current, founded upon the scientific principles which he has propounded.

In paralysis he says:—

"Abstraction being made of all purely theoretical ideas, and independently of all hypothesis of the nervous force, we may admit that, in certain cases of paralysis, the nerves undergo an alteration analogous to that which they would suffer if they had been subjected to a continued passage of the electric current. We have seen that, in order to restore to a nerve the excitability lost by the passage of this current, it is necessary to subject it to the action of the inverse current. I must add, in favour of the efficacy of the therapeutic use of this current, that a limb, although paralyzed, constantly suffers some contractions when it is submitted, either to the passage of a current or to the action of electric discharges; and these contractions favour the restoration of the functions of the muscles. Experiment confirms these ideas: divide the two sciatic nerves of a living frog, allow one of the two limbs to remain quiet for ten, fifteen, or twenty days, and submit the other, two or three times a day, to the action of the current. The latter will continue to contract, whilst the other will fail to give any contractions when the current is applied to it. I am anxious to state to you some rules which I consider as important in the application of the current to the treatment of paralysis. You should always commence by employing a very weak current. This precaution seems to me now more important than I formerly believed it to be, having seen one paralytic patient seized with true tetanic convulsions under the action of a current furnished by a single element. Take care never to continue the current for too long a period, especially if it be energetic. Apply the interrupted current in preference to the continued one; but after *twenty* or *thirty* shocks, at the most, allow the patient to have a few moments' repose. Both practice and theory seem to prove, that the interrupted current is more useful than the continued one. A pile, with Masson's wheel, or, still better, the electro-magnetic machine, is the most convenient apparatus for this purpose. Electro-magnetic apparatus are now constructed, in which the interruptions of the current are made without the necessity

of an assistant. We may employ, as conductors, two ribands of sheet lead or copper. The extremities, which are placed in contact with the skin, should be covered with cloth moistened with salt and water. In some cases, it is useful to employ, as extremities of the conductors acupuncture needles. The number of authentic cases of paralysis cured by the electrical treatment, is already sufficiently great to encourage physicians and patients to persevere in its use. Perseverance, indeed, is indispensable in the application of the electric current, for without it, successful results are impossible."—(pp. 273, 274, 275.)

Prof. Matteucci was the first to apply the electric current in tetanus.

"The principles on which is founded its employment for the cure of this disease are the following. A current which circulates by jerks in an animal during a certain time, produces tetanic convulsions; the direct current, if continued sufficiently long, produces, on the contrary, paralysis. From this it was concluded, that the continued passage of the latter, in a tetanized limb, would destroy this condition, by producing a state more or less allied to paralysis. The truth of this conclusion is demonstrated by facts. In operating upon frogs which have been tetanized by narcotics or hydrocyanic acid, we observe a fit of tetanus cease under the influence of the prolonged passage of a direct current. The frogs die without presenting those convulsions, which are observed take place when these animals have not been submitted to the direct current."—(pp. 275, 276.)

During the passage of the current, the convulsions were moderated; the patient was able to open and shut his mouth; and the circulation and respiration appeared to be re-established. But the amendment did not continue. With regard to vesical calculi, he observes,

"It is sufficient, however, to remember, that the substances which compose urinary calculi are insoluble in water, to be convinced that such an application has no basis to rest on."—(p. 276.)

As for cataract, he remarks, that it is possible to create a cataract, but impossible to destroy it. Petrequin, of Lyons, has recently proposed the use of galvano-acupuncture for the cure of aneurisms, founded on the property which the electric current possesses, of coagulating the serum of the blood, and, consequently, of partially filling up the aneurismal sac.

Lectures XIV. and XV. are on *Nervous Force.* Professor Matteucci argues for, and conclusively (to us) shows, that whilst there is an analogy between the electric and nervous forces, that they are not identical. This might have been inferred from what has already been detailed.

"We have seen that this current exists in the integrant parts of the muscles, as well as between the molecules of two bodies which enter into combination; that it circulates there without any regularity, and one might say that, as Ampère imagined, it took place in magnetizable bodies, and that it is only by an experimental arrangement that we can discover the presence of this current. We have also shown, that the nerves have no direct influence over the production of this current, and that their office is limited, in experiments on the muscular current, to that of a slightly conducting body, communicating with certain parts of the muscle." * *

"*In the present state of science, and with the means of experimenting which we at present possess, no sign of the electric current is found in the nerves of living animals.*" (pp. 282, 283.)

It has been asserted, that steel needles introduced into the muscles perpendicularly to the direction of their fibres, become magnetic, especially at the moment that the muscles contract. Matteucci repeated all these experiments most carefully, but fruitlessly. He also tried the effect of introducing into an exposed nerve of living animals, the conductors of delicate galvanometers, by two points as far apart as possible, but without ever obtaining evident and constant traces of the electric current. Our author

adds that, from what we know of the properties of electricity, and of the laws of its propagation, it is impossible to conceive the existence of a current circulating in the nerves. The laws of its propagation require conditions which are not found fulfilled in the nervous system; the propagation of its force is interrupted by causes which could not produce a similar effect upon the electric current.

The phenomenon of *contraction by induction*, or *induced contraction*, was discovered by Matteucci some years ago. If the nerve of a galvanoscopic frog be placed upon one or both thighs of a frog prepared in the usual manner, and the two poles of a pile be applied to the lumbar plexus, when the muscles of the thigh contract, convulsions simultaneously occur in the galvanoscopic claw, whose nerve rests upon the thighs in contraction. This phenomenon also occurs when the nerve of the galvanoscopic frog is placed upon the muscles of the thigh of a rabbit, which are made to contract by means of a current acting upon the crural nerve. Very fine layers of different substances, as gold leaf, thin and insulating lamina of mica, or glazed paper, being interposed, prevent the phenomenon. From this, Prof. Matteucci concludes:—1. That we cannot consider the induced contractions of the galvanoscopic frog to be due to the electric current; and 2. That we might, on the contrary, assume, that an electric discharge happens during the contraction of the muscles. A long series of experiments is enumerated, relative to the circumstances which intervene in producing, modifying, or destroying, the phenomenon of induced contraction, which further proves the non-identity of nervous force and electricity, though there is a certain degree of analogy between them.

"We are, then, still ignorant of the cause of muscular contraction, and all that we know of this phenomenon are the following particulars: it is produced, even when acting at great distances from the muscle, upon the nerve, whose ramifications it receives; the integrity of the nervous filament from the point where the excitation takes place to the muscle itself is indispensable; this transmission is effected with such rapidity, that we are compelled to compare it to that of electricity, light, and radiant caloric, propagating itself through various media; what modifies, augments, or destroys the accomplishment of the chemical physico-phenomena of the nutrition of the muscle, has an analogous action upon its contractability, provoked by any influence acting upon the nerves; and, lastly, in the laws of the contraction of a muscle, we find an analogy with the physical laws of elasticity."—(p. 319.)

The fact of induced contraction will, then, be a phenomenon of induction of this unknown force, which circulates in the nerves, and produces muscular contraction. Prof. Matteucci proposes to call, henceforth, this new phenomenon of nervous force, *muscular induction*, instead of induced contraction.

In conclusion, we shall give the following summary of Matteucci's hypothetical views respecting the nervous force, from the *Comptes Rendus*, (15th March, 1847,) appended to these lectures, by the editor, Dr. Pereira.

"1. The nervous fluid is produced by the chemical actions of nutrition.

"2. This fluid, developed principally in the muscles, is diffused there, and being endowed with a repulsive force between its parts, like the electric fluid, retains the elements of the muscular fibre in a state of repulsion analogous to that presented by electrified bodies.

"3. When this nervous fluid ceases to be free in the muscle, the elements of the muscular fibre mutually attract each other, as we see happens in cadaveric rigidity.

"4. This nervous fluid enters continually into the nerves, and from them passes

to the brain, assuming in these bodies a new state, which is no longer that of the free fluid: in this manner it passes from the muscle to the nerve. According to the quantity of this fluid which ceases to be free in the muscle, the contraction is more or less strong.

"5. This state is that of the nervous current, or species of discharge which proceeds from the nervous extremities to the brain, and returns in the contrary direction, by the act of the will.

"6. When this discharge takes place, muscular contraction ought to take place, the fluid ceasing to be free in the muscles.

"7. This discharge of nervous fluid, acting as in the electric fish, explains the induced contraction; in both cases, and by the same disposition of parts, the nervous current produces a species of electric polarization of the elements, either of the muscular, or of the electric apparatus: the difference of effects will be due to a different number of elements, to their dimensions, &c.

"8. The electric current impedes the nervous discharge, if it be directed in the contrary direction; as in the direct current: the nervous fluid not being able to enter and accumulate in the nerve, this loses its excitability. The contrary takes place for the inverse current, which goes in the same direction as that of the nervous discharge: the nervous fluid is found accumulated in the nerve, and its excitability is augmented."—(pp. 326, 327).

Lectures XVI., XVII., XIX., and *XX.*, are excellent and well digested summaries on *Muscular Contraction*, *Animal Mechanics*, the *Circulation of the Blood*, the *Vocal Apparatus and Voice*, *Hearing*, and *Vision*. They contain no original observations of value, being chiefly compilations, most cleverly done, however. We must be content with referring our readers to the volume itself, which is now in course of re-publication in this country.

We cannot dismiss this admirable work, without expressing our conviction of its intrinsic worth; an opinion with which, we think, the reader of our imperfect analysis will agree. These lectures are a timely and precious contribution to physiology, and will hold there an honoured place, characterized by their accurate and philosophic character. In distinguishing the physical from the vital phenomena of living beings, and referring them to their proper laws, Professor Matteucci has laid the foundation of a new branch of science. An ingenious and skilful experimenter, his generalizations are cautious and trustworthy. He has gone to his task in a right spirit; and science is deeply indebted to him. Throughout the volume he has carefully kept in view the promise made in his first lecture, and fully redeemed it.

"In these lectures I propose to myself another, and not less important object; it is to introduce, in the exposition of physiological facts, and in the investigation of their laws, that precision of language, that exactitude of expression, that rigorous method, which are too often discarded in the study of physiology and of medicine, and which have been hitherto almost exclusively characteristic of the physical sciences."—(p. 14.)

M. C.

BIBLIOGRAPHICAL NOTICES.

ART. XIV.—*The History, Diagnosis, and Treatment of the Fevers of the United States.* By ELISHA BARTLETT, M. D., Professor of the Theory and Practice of Physic in the Medical Department of Transylvania University; Member of the American Academy of Arts and Sciences; Author of an Essay on the Philosophy of Medical Science, etc. etc. Philadelphia, Lea & Blanchard, 1847: 8vo. pp. 547.

THIS is a second edition of Dr. Bartlett's work on Fevers, published in 1842; greatly improved, and enlarged to nearly double the size of the first edition. In the latter was comprised the history of typhoid and typhus fever, with merely a short account of the diagnostic characters of periodical and of yellow fever. The complete history of the two latter fevers, constituting one-half of the volume, has been added to the edition before us; thus rendering the work what it professes to be, a systematic and methodical treatise on the Fevers of the United States.

In its present form, it does great credit to the author's industry and sound discrimination, as well as to his professional talents; while by the full and accurate history it presents of all that is known in relation to the pathology of the fevers embraced in it, with its cautious analysis of the morbid phenomena attendant upon, and those which are, so far as has been ascertained, peculiar to each, it cannot fail to be an acceptable addition to the library of every practitioner.

Dr. Bartlett is not much of a theorist; his principal business is with facts, and the estimate of their real value and relationship, and though he may, perhaps, occasionally give to one series of facts an undue importance, or force others into a false collocation, his analysis of them, in reference to the pathology of the diseases of which he treats, will, in general, be found to be marked by due caution and judgment, while his conclusions are neither bold assumptions from imaginary premises nor metaphysical subtleties tortured out from the materials before him.

His pathological histories are a simple digest of the facts collected by those who have had the most ample opportunities of studying each of the diseases and forms of disease embraced within the treatise—the observations of one practitioner being carefully collated with those of others In the few instances in which the author does attempt to theorize, it is with extreme diffidence and divested of everything approaching to dogmatism.

Dr. Bartlett's views of fever, in the nosological sense of the term, are perfectly correct, and if generally adopted would save much profitless discussion, and the weaving of pathological theories calculated to impede rather than to facilitate the acquisition of correct general views.

"There is," he remarks, "no such individual disease as that which has always been expressed, and which is still expressed by the term *fever*. How then can there be any *theory* of fever? There are many separate diseases, to which this generic name is properly enough applied, on account of certain general analogies, which exist between them. *But the disordered actions and processes, which constitute one of these diseases, may differ essentially;* and, *as far as we can ascertain, in most cases they do so differ, from those which constitute another of these diseases. The theory of one fever, then, must be wholly, or to a great extent, inapplicable to another.* The elements which enter into the composition of one problem are not to be found in the other, or they are present in different proportions. *The word fever, when used, as it commonly is, to designate a disease, has no intelligible signification.* It is wholly a creature of the imagination—the offspring of a false generalization and of a spurious philosophy. What, then, can its *theory* be, but the shadow of a shade?"

The first part of the present volume is devoted to a consideration of typhoid fever. Its history is given with great clearness, accuracy, and fullness; its symp-

toms are carefully analyzed; its anatomical lesions minutely delineated; its etiology, so far as determined by the result of observation, correctly pointed out, and its varieties and forms, duration, march, complications, mortality and prognosis, concisely indicated. The diagnosis of typhoid fever, as described by Dr. Bartlett, is based upon the doctrine of the disease being essentially and fundamentally distinct from typhus fever; even, however, considering it as merely a particular form or variety of the latter, its correct diagnosis is hardly less important in a practical point of view, and such a diagnosis is very ably laid down by the author in connection with his history of typhus fever.

Typhoid fever, Dr. Bartlett maintains to be a disease radically dissimilar from typhus in its nature, symptoms and pathology, and in this he follows the views of the most authoritative of those who have written upon the disease. If a well-marked case of typhoid fever be compared with one presenting the phenomena described as characteristic of typhus fever, a very decided dissimilarity between the two may be detected. But the two affections do not always occur with such evident distinctive characters. We have lately seen a great number of cases of fever in recently arrived Irish immigrants—the majority of the cases were of well-marked typhus fever, a few were of equally well-marked typhoid fever, while, in a third class of cases, the characteristics of these two fevers were so completely blended, that it was very difficult to determine which of the two predominated. Here then we have persons, who have been exposed to precisely the same morbific causes, attacked with fever of a similar type, bearing the characters in some of the typhoid fever, in others of the typhus, and in others again a union, as it were, of the characteristics of both. This fact would seem to prove, that the typhoid is a mere form or variety of the typhus fever. Of course, by those who maintain that these two fevers are radically distinct, the diagnosis would be based upon the presence or absence of the characteristic lesion of the elliptical plates of the ileum. But before the lesion referred to can be assumed as diagnostic of typhoid fever, and as establishing an essential difference between it and typhus fever, it must be shown that the presence of this lesion is invariably connected with that particular concourse of symptoms which is characteristic of the disease, and that the two are in all cases coincident. We place but little importance upon our own post-mortem examinations in the settlement of this question—they have been too few to enable us to base upon them any important conclusion:—others, however, who have had more ample opportunities in this respect, than ourselves, assert that no lesion of the elliptical plates was to be detected in cases presenting all the symptoms described as characteristic of typhoid fever, while, on the other hand, the lesion has been repeatedly met with in cases in which the symptoms alluded to were absent. Dr. Bartlett admits, that—

"There is no *uniform proportion* between the extent of the local disease, and the severity of the symptoms. There are many fatal cases, in which the intestinal lesion is very limited in extent; there are others, where the whole character of the disease has been unusually mild, and in which, when life has been destroyed by some secondary and accidental complication, the alteration of the intestine has been found to be very extensive and profound."

In the present state of our knowledge on this subject it is, we conceive, much safer to consider the typhoid as one of the forms of typhus fever. Its distinct and specific character has not, as yet, been satisfactorily established.

We do not much admire the plan pursued by Dr. Bartlett in his exposition of the therapeutical management of typhoid fever. To detail the various plans of treatment pursued by different practitioners, particularly when these plans are, confessedly, to a certain extent opposed to each other, is not calculated to lead the young and inexperienced members of the profession to correct views as to the most successful mode of managing the disease. We do not believe that the subject is surrounded with so much difficulty or that the facts upon record are too few, to enable us to form a correct estimate of the best plan of treatment in the disease under consideration. The general principles of therapeutics, and the leading morbid phenomena in each case of the disease, aided by the observations of those who have had ample opportunities of treating this particular form of fever, will not lead us far astray in determining its proper remedial management.

The second part of the volume is devoted to a consideration of the history, diagnosis and treatment of typhus fever. In relation to the first of these points the author has presented a very faithful analysis of all the well accredited facts upon record. The results of this analysis are by no means so satisfactory, it is true, as are those derived from the analysis of the facts in reference to the natural history of typhoid fever. This results from the few entire and elaborate histories of the disease that have been published—the little attention that has been paid to determine its true symptomatology and anatomical lesions, and to distinguish between its true and proper characteristics, and the phenomena dependent upon the various complications with which it is so frequently attended.

In treating of the causes of typhus fever, Dr. Bartlett examines the question of its propagation by contagion—and arranges himself among those who maintain the affirmative; but denies that the disease is exclusively and invariably the product of contagion. He admits, however, that, as a general rule, the contagious principle must be concentrated and abundant, so to speak, in order to excite the disease: that a few cases, in a large, cleanly, and well ventilated ward, do not often communicate the disease to the other occupants, nor to the medical attendants and nurses.

The chapter on diagnosis is a good one—and although we cannot agree with the author as to the radical dissimilarity between typhus and typhoid fever, we admit the accuracy of his diagnosis between the more marked cases of these two forms of disease. The historical portion of this chapter is particularly interesting.

A very good summary is given in the chapter on treatment, of the therapeutics of typhus fever.

The present and preceding parts of the volume, conclude with a bibliographical notice of the leading publications in relation to the diseases treated of.

Part the third is devoted to a consideration of the history, diagnosis, and treatment of periodical fever—embracing intermittent, remittent, and congestive fever. All of these, Dr. Bartlett considers to be merely varieties and modifications of a single individual disease. This is probably a correct view; and yet, between the phenomena characteristic of the different forms of periodical fever, there is a much more striking contrast, than between those of typhoid and typhus fever. And even some evidence has been adduced, to prove that the anatomical lesion, supposed to be diagnostic of typhoid fever, is occasionally present in cases of remittent fever.

The analysis of the symptoms of remittent fever, presented by Dr. Bartlett, is sufficiently full and accurate.

The following are his general remarks upon the relation of the anatomical lesions of periodical fever to the symptoms; the most important point to be settled in the pathological investigation of every disease:

"It is sufficiently demonstrated by the foregoing details, that periodical fever does not often destroy life, without leaving behind it very decided, and somewhat extensive anatomical lesions. As I have done, in regard to the fevers already treated of, I propose here to say a few words about the connection between the symptoms of the disease, on the one hand, and these lesions, on the other. This connection, so far at least as the most constant and important pathological alterations are concerned, would seem to be pretty uniform and direct We can hardly hesitate, I think, for instance, in referring the nausea, vomiting, and epigastric distress, so nearly always present, to the disorders of the mucous membrane of the stomach, resulting in the changes that are found after death. So the moderate fulness across the upper part of the abdomen, with the tension, the feeling of weight and oppression, in each hypochondrium, and especially in the left, are evidently connected with, and dependent upon, the congestion of the liver and spleen, resulting in the alterations which these organs constantly exhibit. In the same way, it is impossible to doubt that the coma and delirium, are intimately and directly connected with the striking lesions usually found in the brain and its membranes; and if the relationship here sometimes fails—if it is not absolutely invariable—this is only what happens occasionally, even with the best established and most constant of these relations, in other diseases. M. Maillot thinks that the *algid* symptoms—the failing circulation, and the icy coldness—are especially and

immediately connected with the lesions found in the spinal marrow and its membranes.

"I do not see any reason to suppose that the lesions of periodical fever follow any fixed or uniform order of succession in their development. The congestions and irritations of the several organs and tissues, which bear the chief burden of the disease, are, in many cases, evidently simultaneous in their origin—occurring together; in others, the weight of the disease, to use the favourite phraseology of the older writers, falls principally upon one organ—the brain, for instance; in still others, upon some other organ—the stomach, the liver, or the spleen;—and all this, without anything that is constant or regular."

The etiology of periodical fever, is considered at some length; the best ascertained facts in relation to this subject, are briefly presented, and the necessary deductions from them accurately stated. In the following remarks the author evinces a praiseworthy cautiousness:

"In regard to the alleged agency of animal and vegetable decomposition in the production of the poison of periodical fever, I have but little to say, and this for the simple but sufficient reason, that we have no positive knowledge upon the subject. Unquestionably, there is a very active decomposition, both of vegetable and of animal substances, usually going on in malarious localities; it is possible enough that this decomposition may produce the poison; but there is no positive evidence yet that it does so; and there are some reasons for doubting it altogether. One of these reasons is to be found in the common and notorious fact, that this same decomposition is constantly going on without giving rise to periodical fever. The hypothesis of the animalcular origin of this, and of some other endemic and epidemic diseases, is an old one, and has been recently revived and advocated with great ingenuity and ability. It is only a hypothesis, but it may be safely said of it, I think, that it may be made to correspond to the ascertained phenomena in connection with the etiology of these diseases, better than most other hypotheses; and that it is less embarrassed by objections which cannot be met, and by difficulties which cannot be overcome."

Although, among the varieties of periodical fever, the author includes congestive fever, and gives a very good description of its several forms, he spends but a few words in relation to its pathology. Considering the very common use, and we might add, very frequent abuse, of the term congestive fever, this is to be regretted. The author has, apparently, made it a point to avoid as much as possible, entering upon any theory of the nature of the diseases of which he treats, beyond that which appears to him immediately deducible from the facts detailed; still we regret that he has not entered into a more minute analysis of the pathological phenomena of those fevers, to which the term congestive is most usually applied; such an analysis would, we believe, be calculated to lead to important practical results.

In its connection with the grave forms of periodical and other fevers, the congestion would appear to Dr. Bartlett, to be connected with some unknown but profound modification of the great function of innervation. In this opinion he is no doubt correct—but from the supposition, that when innervation is suddenly and violently perverted, there occurs, at the same moment, "a like sudden and violent rush of blood towards some one or more of the organs; or a draining off of the serum, as happens in epidemic cholera,"—we must dissent:—The phenomena of what are termed congestive diseases—the anatomical lesions connected with them, and every correct view of the physiology of the circulation, are opposed to the idea of this *sudden and violent rush of blood.*

A very excellent summary of the treatment of periodical fever is given by the author as applicable to the forms of bilious remittent fever, congestive fever, and intermittent fever. The author denounces the system of excessive purgation, in the first of these forms, which from the influence of a preposterous pathological theory, has been pretty extensively prevalent throughout many portions of our Southern and Western States.

A good, but not very extensive bibliography of the various publications upon the subject of periodical fever, closes this part of the work. Many noted works on this subject are not noticed by the author; to have gone over the entire list of the

treatises that have been written on periodical fevers, even in the hasty manner with which those enumerated are considered, would have required a volume as large as the one before us.

The fourth and last part of the volume treats of the history, diagnosis, and treatment of yellow fever.

Notwithstanding the indirect apology which Dr. Bartlett offers for introducing into the volume an account of the yellow fever, from his entire want of person knowledge in regard to the disease, he has, nevertheless, succeeded in presenting a very fair and very valuable exposition of all the leading facts in relation to it. His analysis of the symptoms of this peculiar and strictly specific fever, is marked by great accuracy, while his account of its anatomical lesions corresponds with the observations of those physicians who have most accurately investigated this portion of its pathology.

We regret, however, that the author has not extended his inquiries still further; and by a careful comparison of the pathological histories of the various epidemics of yellow fever, that have occurred in different portions of the world and at different periods, he has not, so far as these histories afford sufficient data, endeavoured to solve the question, whether under the general name of yellow fever, very dissimilar diseases are not included. We have reason to believe, that such is actually the case. In no other manner can we account for the very great discrepancy in regard to almost everything that relates to its natural history, its morbid anatomy, and etiology, which the observations of different observers present, in regard to whose honesty, accuracy of observation, and opportunities for the study of the disease, there can be no question.

On the subject of the contagion of yellow fever, Dr. Bartlett contents himself with noticing the various hypotheses that have been emitted in regard to this important question, and the facts adduced by the supporters of each in defence of his own views, without attempting to come to any decision as to their comparative truth, or the relative weight of the evidence upon which each rests. His account of its etiology is, in other respects, correct and satisfactory.

Dr. Bartlett's *definition* of *yellow fever* presents so concise and accurate an outline of the leading features of the disease, that we must transcribe it.

"Yellow fever is an acute affection; occurring at all ages, but much more frequently during the middle and active period of life, than either earlier or later; attacking, in a large majority of instances, persons who are not permanent residents in the places where it prevails,—sometimes extending, however, especially in localities where it is of rare occurrence, to such residents; rarely occurring twice in the same person; much more common in the white than the negro race; generally milder in its character amongst children and women than amongst men; confined to certain geographical localities, and especially, to commercial seaports in hot climates; prevailing most extensively during the latter part of the hot season; often epidemic, but sometimes sporadic in its appearance; not capable of transmission from one person to another in a pure atmosphere; depending for its essential cause upon a poison of terrestrial origin, the nature and composition of which are entirely unknown,—which poison may be shut up in small and close apartments, in clothes, bedding, and so on, and transported from one place to another, and which is destroyed by a freezing temperature:—sudden in its access; commencing with an initiatory chill, ordinarily of moderate severity, and of short duration: the latter accompanied with acute and violent pains in the head, back, and limbs, or immediately followed by them; then by a red suffusion of the eyes, moderate heat of the skin, and moderate acceleration of the pulse, loss of appetite, and thirst; a moist, white, villous tongue, with rosy tip and edges;—these febrile phenomena diminishing in activity, and mostly disappearing, in from twenty to thirty-six hours;—the first stage of the disease, thus characterized, passing, in mild cases, into convalescence, but in grave cases, being followed, after an interval of apparent but deceptive amelioration, by nausea and vomiting,—the matter ejected from the stomach, in cases that are to terminate fatally, resembling coffee grounds; black or dark-coloured stools; epigastric distress, general restlessness, and jactitation; sighing respiration; hiccough; a yellow colour of the skin; coldness of the extremities, gradually extending to the trunk; and finally, by death;

the mind usually remaining free, but apathetic and indifferent, up to the close of life; which symptoms differ very widely in their degree of severity, and especially, in their number and combination, in different cases, thus giving rise to different varieties and grades of the disease; which symptoms, furthermore, may either subside and disappear, in the course of a few days from the time of their commencement, or may terminate with death, between the third and seventh day of the disease; the bodies of patients exhibiting, on examination after death, in most cases, a yellow or buff colour of the liver, with dryness of its tissue; black spots or masses, more or less numerous in the lungs; softness and flabbiness of the substance of the heart, and in nearly all cases, unusual thinness and fluidity of the blood; and redness, mamellonation, changes in the thickness, and softening—one or more—of the mucous membrane of the stomach; this organ and the intestines usually containing a considerable quantity of a very dark or black fluid or semi-fluid matter; which disease differs essentially from all others, in its causes, its symptoms, and its lesions; and is only to a moderate extent, at least in its graver forms, under the control of art."

This is the neatest, most accurate, and comprehensive definition of yellow fever we have met with. It does much credit to Dr. Bartlett, who, unacquainted with the disease from personal experience, has evidently studied with care its history, as recorded by others, and analyzed with great judgment its peculiar features.

In regard to the nature of yellow fever, we know as little, if not less, than we do of any of the other fevers. Dr. Bartlett believes that it is not a simple gastritis.

"Notwithstanding," he remarks, "the general presence, and the grave character of the lesions of the gastric mucous surface, in fatal cases; and the corresponding constancy and gravity of the gastric symptoms, it seems to me, that a rational interpretation of all the phenomena of the disease leads inevitably to the conclusion above stated. The order of succession, in the phenomena of yellow fever, is not such as occurs in simple acute gastritis. The gastric symptoms do not accompany the general febrile excitement; the latter precedes the former. If the high fever of the first period is dependent upon gastritis, there should be, at the same time, some local symptoms of this latter. The first stage of the disease is not accompanied by any signs of gastric inflammation; and in mild cases, and, not unfrequently, also, even in pretty severe cases, which terminate in recovery, there are no such signs during any period of the disease. This could not be so generally the case, if the disease consists primarily and essentially in an inflammation of the mucous membrane of the stomach. The gastritis, there is every reason to believe, is a secondary lesion, like that of Peyer's glands in typhoid fever, one of the results, immediate or remote, of the unknown poison of the disease."

Dr. Bartlett considers it very probable that a most important element in the pathology of yellow fever, is to be found in the alteration of the blood.

"The etiological poison of the disease, received into the system, works a morbid change of some sort in this fluid, the immediate effects of which are manifested in the first stage of the disease; in mild and moderate cases, these effects are carried no further; but in grave and fatal cases, there are superadded to the contamination of the blood, certain consecutive local lesions, especially of the liver, and the mucous membrane of the stomach."

In regard to the treatment of yellow fever, our author, after enumerating the results of the experience of some of the leading physicians, whose opportunities for judging of the results of the practice pursued by them, give to their opinions considerable authority, provided we can in all cases depend upon the accuracy of their diagnosis, concludes by presenting the following general conclusions.

"The simple and milder form of yellow fever, occurring sometimes in unacclimated adults, but more frequently amongst the acclimated, or partially acclimated, and in children, usually terminates favourably, independent of any of the ordinary modes of treatment. Perhaps this termination is promoted by a mild but efficient cathartic.

"The open inflammatory form of the disease is mitigated in severity, and its danger diminished, by prompt and pretty free blood-letting—general and local; and by an efficient cathartic.

"The congestive form of the disease. and the other forms, if they pass into the stage of collapse, usually terminate fatally, and are but little under the control of art. In those cases, the method of treatment usually followed by Spanish practitioners, and adopted by the physicians of Mobile, seems to promise more success than any other."

The practice to which reference is here made, consists in a dose of calomel, given in the early stage, followed by castor oil, olive oil, or salts and senna, to promote its free action upon the bowels; when the rigors continue long, a warm mustard bath. Perspiration is promoted by warm drinks—and cups are applied to the cervical or epigastric region, as they seem indicated. During the period of calm, the lighter diffusible stimulants are usually given with blue pill. The transition of the disease into the third stage, or that of collapse, is carefully watched, and met with an active stimulant treatment. Brandy-toddy or julep is usually preferred. This is to be continued—its effects being carefully watched—until the depressing tendency of the disease is fully arrested, when small quantities of chicken or oyster broth are cautiously given.

A tolerably full bibliography of the leading works on yellow fever close this part. In this, we are gratified to find Dr. Bartlett doing justice to the publications on this subject of Dr. William Currie, of Philadelphia—a medical writer whose talents have been much underrated by the profession in this country, while the valuable contributions made by him, to our knowledge of many of the more important of our endemic diseases, have been strangely overlooked. Dr. Currie, unfortunately out-lived his mental powers—and the state of fatuity in which he was known to most of the American physicians now living, may account in some measure for the low estimate in which he is held by many as a medical observer.

Speaking of his memoirs of the yellow fever, and of his observations on the causes and cure of remitting or bilious fever, &c., Dr. Bartlett remarks:—

"Both these volumes are marked throughout by careful observation, by a correct philosophy, and by sound sense. Dr. Currie was a cotemporary of Dr. Rush, and a practitioner in the same city. His general descriptions of disease are quite as good, to say the least, as those of his distinguished fellow citizen, and his medical philosophy infinitely sounder and more rational. He recognized clearly the radical difference between bilious remittent and yellow fever."

In the correctness of these remarks, we fully coincide.

Throughout the volume before us, there is a spirit of candour and impartiality displayed by the author—which, with the general truthfulness and accuracy of his delineation of the several diseases embraced in it, presses it strongly upon the favourable notice of the medical profession. We recommend it to our readers as one of the best—certainly the most complete, systematic, and methodical treatises on the Fevers of the United States, that has yet appeared. D. F. C.

ART. XV.—*The Human Brain; its Structure, Physiology and Diseases, with a Description of the Typical Forms of Brain in the Animal Kingdom.* By SAMUEL SOLLY, F. R. S., Senior Assistant Surgeon to St. Thomas's Hospital, etc. etc. With numerous Wood Engravings. Second Edition. London, 1847: 8vo., pp. 688.

THE first edition of this work was published in 1836, and was noticed in our number for May, 1838. Its object was the diffusion of a sounder and more correct method of studying the anatomy and physiology of the most important system in the body. Though eleven years have elapsed since the appearance of the first edition, the same barren and slovenly method of describing the structure of the nervous centres still, we suspect, too generally obtains. The old, unphilosophical and totally inadequate plan of slicing the brain, is still too frequently pursued; and the effort to trace the relations which exist between the structure of the different component parts, and their functional manifestations, too constantly neglected. It has been justly observed by Foville, that "sections of the brain teach little more than sections of the body would;" and Dr. Craigie has proclaimed the absurdity of the present system in the following forcible language: "To the mind," he says, "which is unfettered by prejudices in favour of ancient opinions, it appears singu-

lar that the enlightened physiologists of the eighteenth century should talk of the medullary and cortical matter of an organ in which nothing like marrow or bark can be seen; and it is more extraordinary still, that the accurate distinctions which anatomy has introduced since the commencement of the nineteenth century have not demonstrated the evil of retaining terms which are improper, as mere nominal distinctions; but which are doubly erroneous as the relics of an unfounded and exploded theory. Is the error of likening the brain to marrow, obviated by shrouding it under the learned denomination of medulla and medullary? Or is the absurdity of supposing the gray matter of the convoluted surface, a bark, or envelope, to the white pith, diminished in the slightest degree by calling that gray matter cortical? The common sense of the present day will not hesitate to answer these questions in the negative."

The plan of study of the anatomy of the cerebro-spinal axis, advocated and pursued by Mr. Solly, is founded on the rational and philosophical basis of investigating its structure, in man, by the light of comparative anatomy. By beginning with the structure and functions of a nervous system in the lowest scale of the animal series, and gradually ascending to the higher and more complex, noting each addition, and its corresponding increase of function, the anatomy of the human brain is at once simplified and invested with general interest. "By pursuing this course," says Mr. Solly, "we shall be rewarded by finding that the encephalon, this apparently most complicated organ in the human being, is but a gradual development from an extremely simple fundamental type on one uniform and harmonious plan, and that the seeming complexity of the cerebro-spinal axis in man, really arises from the great concentration, as opposed to the extreme diffusion of its component parts in the lower order of animals; for in no particular are the higher orders more strikingly distinguished from the lower than in the concentration of function within circumscribed spaces." (Preface, p. x.)

In Part I. the physical, chemical, and microscopical character of the component matter of the brain—neurine, the substance in which the peculiar powers of the brain and nerves reside—is investigated. The two kinds of neurine, the vesicular and tubular, are described. Late researches have amply sustained the views advanced by our author, in his first edition, of their relative function,—that the cineritious neurine is the source of power, and the medullary neurine merely the conductor of it. This view of the subject is now almost universally admitted. The whole of this chapter on the structural anatomy is an admirable epitome of our knowledge on the subject.

Part II. is devoted to the comparative anatomy of the nervous system. There Mr. Solly has shown much discrimination and judgment, by not entering too much in detail into the immense varieties of form which the nervous system of the whole animal kingdom presents; but has used comparative anatomy only as an ally to assist and simplify the study of the human brain. The incorrect or limited application of the term ganglion is objected to, and a more comprehensive meaning, in accordance with the views at present held by physiologists, advocated. It has been too much the habit to regard a peculiar rounded form as necessary to the constitution of a true ganglion. A wrong impression is thus conveyed. "But if the term ganglion be correctly applied to the nodules of neurine, or centres of power in the lowest animals, it is equally correct to apply it to those of the highest; and it therefore follows that the human brain is but a series of large ganglia."—(p. 32.) Mr. Solly repeats the opinion expressed in the former edition, that in extending the term ganglion, so as to apply it to any collection of cineritious neurine into a circumscribed mass, whatever form or arrangement it may assume, we would very considerably simplify the anatomy of the human brain. He proposes to name the cineritious neurine which forms the convoluted surface of the hemispheres of the brain, the hemispherical ganglia, the convoluted appearance being merely accidental, and for the purpose of convenient packing. "There would be," he justly observes, "just as much reason to deprive the semi-lunar ganglion of its generic title, and give it a name merely in accordance with its appearance, as there is in separating the hemispherical ganglia of the human brain from their analogous ganglia in the lower animals, and designating them by a term which gives a mystery to their character they do not deserve. * * * It is a distinct ganglion, and as such ought to have a name." And he adds, in rather homely

phrase, "There would be as much sense in calling the *occipito frontalis muscle* the *cortical substance of the cranium*, as there is in calling the *hemispherical ganglion* the *cortical substance of the brain.*"—(p. 33.) If a better name should be proposed by any other anatomist, Mr. S. expresses his willingness to adopt it. We regret that we cannot follow Mr. Solly throughout this chapter, which is replete with interest and with information essential to a right comprehension of the human nervous centres. It is itself an admirable abstract of the comparative anatomy of the nervous system, which the student must master, to study with pleasure and interest that system in man,—and we can offer no digest of it with any advantage to the reader, but can conscientiously recommend it to his attentive perusal. We should, however, direct particular attention to his excellent, and, in some important respects, original description of the medulla oblongata in the ascending series. It must be gratifying to Mr. Solly to find that his view of the homology and physiology of the cerebral ganglia of the fish, first enunciated in the former edition of 1836, is now very generally recognized.

Part III. treats of the protective apparatus of the human brain; and

Part IV., on the weight of the human brain, is enriched with the excellent tables of Dr. Bird.

In Part V. the configuration of the encephalon is considered, and is illustrated by several admirable drawings from Foville, and the author.

Part VI. is entitled, Dissection of the Human Brain and Spinal Cord, and is a most lucid and unexceptionable description of the anatomy of the great nervous centres in man. It is an accurate and simple analysis of the present state of our knowledge of the component parts of the encephalon, and we know of none other which will enable the student more readily to acquire a complete knowledge of its true character.

As a specimen of his manner of treating this part of his subject, and to show that our appreciation of it is not too great, we shall append his concluding remarks to this chapter. "The above descriptions," says Mr. Solly, "demonstrate that the encephalon or brain in the human subject is not a large solid mass of matter, in the interior of which are cavities scooped, as it were, out of its substance to be appropriately denominated ventricles, but that it really consists of ganglia or collections of cineritious neurine placed on each side of the mesial line. Some of them being the appropriate ganglia of the nerves of sensation; as, for instance, the olfactory ganglia, the optic ganglia, or tubercula quadrigemina, the auditory ganglia, or posterior pyramidal bodies, the pneumogastric ganglia, or restiform ganglia, the olivary bodies or lingual ganglia; the others being the motory or sensory ganglia, as the corpora striata and thalami nervorum opticorum. The hemispherical ganglia again, that they might present the greatest possible extent of surface, are folded up into innumerable plaits, and thus cover or surround every other ganglion within the cranium, so that on first removing the skull-cap, nothing can be seen but the convoluted surface of these extensive ganglia. And here let me insist upon this important principle in the study of the brain, which is also one of the first ideas that the student should acquire regarding its composition, namely, that it consists of corresponding or symmetrical parts on each side of the mesial plane, and instead of regarding the fissures of separation between its different portions as forming ventricles or cavities, he must direct his attention to the ganglia which bound the fissure, and the structures called commissures, which, connecting them together, cross the fissure and necessarily alter its character in different points, making, it is true, but not at any place changing the true fissure into a true bag or circumscribed cavity. The third, the iter a tertio ad quartum ventriculum, the fourth and fifth ventricles, we have already seen, are in truth no more than the successive dilatations from below upwards of the posterior fissure of the cord; difficult enough to be understood when these are viewed in different situations and unconnected one with the other, as in the ordinary mode of dissecting the brain, but which seem necessary and obvious where its parts are traced in connection with one another."—(p. 282.) He adds, that it is too much the custom to burden the memory of the student with fanciful and unmeaning names, and that instead of "puzzling himself with the absurd titles of hippocampus major and minor, pes hippocampi, tænia hippocampi, cornu ammonis, &c., he should be required simply to observe how the spinal columns appear to terminate supe-

riorly in two large tubercles, the *corpora striata* and *thalami*, from the sides and under parts of which the hemispheres spring out, being afterwards reflected so as completely to envelope this bulbous extremity of the spinal cord. In the same way the third ventricle should be described as a fissure separating the two halves of the brain, his particular attention being directed to the commissures which pass across it to connect the different cerebral ganglia with one another. The description of the relative position of these ganglia, the commissures connecting them, and their relation to the ganglia and columns of the spinal cord, comprehend all the information which is either interesting or useful to the student."—(p. 283.)

The cerebral nerves, and the vessels employed in the cerebral circulation, occupy Parts VII. and VIII., when we reach

Part IX., in which the development of the brain is most philosophically handled. This chapter is the complement of the several preceding ones, and admirably illustrative of them, and the views contained in them. It is conceived and executed in the same happy manner. There are no useless details; all is subordinate to the main object—the anatomy and physiology of the human brain. The law of progressive development is nowhere more admirably exhibited than in the nervous centres, and nowhere do we find more decided proofs of the general harmony which prevails throughout the animal kingdom.

Part X., on the physiology of the cerebro-spinal system, is meagre and unsatisfactory as compared with the preceding portions of the work. As an apology, the author states, that "in the anatomical sections of the work, he has purposely introduced much physiology, in order to give more interest to the anatomy than is usually attached to mere details of structure, without reference to function, so that in this section it will only be necessary to give a summary of what has been more or less touched on previously."—(p. 326.) Still, we think, more was required, and should have been done. We fully agree with Mr. Solly that it is "a subject which every candid physiologist approaches with great diffidence, for though much has been done within the last ten years, still much remains in doubtful obscurity." We concur with our author from actual experience, in thinking, "that notwithstanding the various sources of error to which experiments on living animals are exposed, some very important facts have been elicited, which, taken in conjunction with those derived from comparative anatomy, pathology, and observation during life, have afforded collateral evidence of the separate offices of different portions of the brain and nervous system. As regards our knowledge of the functions of the nerves and the spinal cord, experiments have been invaluable; and in reference to the encephalon, when taken in connection with the facts of comparative anatomy, they have shed much light on the subject, particularly those of Flourens and Bouillaud. In so far as this mode of investigation is admissible, the results obtained by these authors are perhaps the best authenticated and the most satisfactory of any."—(p. 327.)

Mr. Solly is quite disposed to accept the ingenious theory of Dr. Carpenter with regard to the offices of the anterior and posterior cerebral ganglia, the optic thalami and corpora striata, first enunciated by that physiologist in his review of Mr. Noble's work on the Brain, in the *British and Foreign Medical Review* for October, 1846, and subsequently in a communication to the British Association, in 1847. These ganglia Dr. Carpenter regards as forming part of the series of sensorial centres, of which there are other members in the olfactory, optic, and auditory ganglia; and that they are independent centres of action, and not mere appendages to the hemispheric ganglia. This view is sustained, he thinks, by the large quantity of vesicular neurine they contain, and from the absence of any correspondence in size between them and the hemispherical ganglia, particularly with respect to the corpora striata, which, in fishes, make up the principal bulk of the second pair of masses; in reptiles, birds, and the lower mammalia, they still form a very large portion of the cerebrum; and in man and the higher mammalia, are only subordinate, because of the large relative development of the hemispheric ganglia. On the other hand, there is scarcely any rudiment of the thalami optici to be discovered in fishes: their proportional size increases in reptiles, birds, and the lower mammalia; but it is only in man that their dimensions approach those of the corpora striata. The peculiar connection of the thalami optici with the posterior columns of the spinal cord, and their great development in man, suggest

the idea, according to Dr. C., that they are the ganglia of *tactual* sensation; whilst the connection of the corpora striata with the anterior columns indicates the relationship with the motor function. The close relation between the thalami optici and the corpora striata, harmonizes with the fact that the greater number of muscular movements are directed by common sensation; "whilst the special connection established by the inter-cerebral commissure between the corpora striata, and the optic ganglia (tubercula quadrigemina) explains the peculiar influence of the sense of light in directing certain classes of muscular actions. The communication which is formed by the medullary substance of the cerebrum between these ganglia and the hemispheric ganglia seems to be the medium by which *sensations* are transmitted to the latter, to become the stimulus of intellectual operations, and by which the influence of *volition* is transmitted downwards to excite muscular motions through the corpora striata.

"The whole chain of sensory ganglia is regarded by Dr. C. as not only the instrument by which sensations are received, but also as the centre of those *automatic* muscular movements, which differ from those of a simply reflex character, in being dependent upon sensation. To this head, he refers the purely *instinctive* actions of the lower animals, as well as a variety of actions performed by the human being, both in health and disease; such as the consensual movements of the eyes, the regulation of the laryngeal muscles in the production of vocal sounds, the convulsive movements in hydrophobia, brought on by the sight or sound of water, &c. &c. And he considers the actions which become automatic by *habit*, as executed through the same channel; each movement being directly prompted by the sensation with which it has become associated."—(pp. 334, 335.)

Of the hemispherical ganglia, Mr. Solly rightly says: "If there is one point in the physiology of the brain more unequivocally demonstrated than another, it is that these ganglia are the instruments of the mind—the portion of the brain in which sensations are converted into perceptions, and give rise to ideas. Comparative anatomy, developmental anatomy, experiments on living animals, *observations on its size and form, as indicated by the size and form of the skull*, and last, but not least, pathology; all afford a mass of overwhelming evidence that this portion of the brain, and this only, is the cerebral organ of intellectual power."—(p. 335.) The italics in this quotation are our own, for Mr. Solly here appears as the advocate of phrenology—not violent or intemperate, but still decided—and assigns four reasons for believing that there must be a great deal of truth in it, in all of which, however, we discover nothing new, or particularly convincing.

The concluding and XIth Part, treats of the Diseases of the Brain, and has been added to the present edition. The author tells us, in his preface, that it was added because he believed it would render the work more useful. That it will increase its sale, under the false plea of making it more practical, we can readily conceive. But his limits were necessarily too confined to enable him to do the same justice to this portion of his subject, as had been done to the previous parts. Still, there is much valuable matter in it, and we only regret that it was not expanded into another volume. Some of the sections are capital summaries of all that is useful of the several cerebral affections of which they treat. We might especially indicate that on inflammation of the hemispherical ganglia; and we regret that we are unable to follow Mr. Solly more particularly in his pathological chapters.

The volume is a beautiful one, and is illustrated with one hundred and eighteen well executed wood engravings, for the general accuracy of which, the author vouches, many of them being from original drawings. We have noticed, however, very singular inaccuracies in the orthography of familiar proper names—as, *Diemebrok*, for Diemerbroeck; *Erastatus*, for Erasistratus; *Whyte*, for Whytt; *Durand-Fardell*, for Durand-Fardel; *Beclard*, for Béclard; *Pruss*, for Prus; *Pritchard*, for Prichard; *Lallemande*, for Lallemand; and several others.

In conclusion, we must state the exalted opinion we entertain of this volume. The author has carefully arranged all that is known upon the anatomy and physiology of the human brain; he has cleared the path of inquiry of all unnecessary incumbrances; he has simplified, and improved upon, many of the ordinary methods of description; and has raised for himself an enduring monument.

M. C.

ART. XVI.—*Practical Physiology for the Use of Schools and Families.* By EDWARD JARVIS, M. D. Philadelphia, 1847: Thomas, Cowperthwait & Co.: pp. 368, 12mo.

"EVERY human being is appointed to take the charge of his own body. He must supply its wants, direct its powers, regulate its actions, and thus sustain his life. This responsibility for the care of health, takes precedence of all others, and requires the earliest attention to prepare to meet it. Before any one can have any use for other knowledge, he must know how to live. He should, therefore, learn the nature and the wants of his frame, and of its various organs, even earlier than he studies the features of the earth, the science of numbers, or the structure of language; for, before he can put these to any practical use, he must eat and breathe, and move, and think. Physiology should, then, be included among the subjects of all school education, and thus preparation be first made for the fulfilment of the first responsibility of life."

Such is the distinct and forcible appeal made to the common sense of every reader by Dr. Jarvis, in the preface to the work, whose title heads this article. The truths it contains, all must admit, and the lessons which it inculcates, all must desire to learn. But how is this to be done? What means are at the disposal of teachers and of others, to enable them to fulfil these expectations from them? Several treatises, professing to teach physiology, in familiar and popular language, have been published; but it must be confessed that they generally serve only to show, with all their merits, how difficult it is to make scientific subjects intelligible without the use of technical language, and without dwelling too much on non-essentials, while matters of real importance are merely glanced at. If science is to be made popular, and we must confess we doubt the practicability of it, it must be done in such a manner, as not to fatigue the mind by too much detail, and so that "he who runs may read." Now, Combe's "Constitution of Man" fulfils this condition, as regards physiology, better than perhaps any hitherto published work, containing all that may be called useful knowledge to every man. Its style is good, the manner in which it treats the subjects on which it descants, is exceedingly attractive; and, with some exceptions, the information it gives is founded upon the received facts of science, while its popularity is sufficiently attested by the extraordinary sale it has met with everywhere. A better text-book, and more scientific work, is the Physiology for schools, by Dr. Reynell Coates, which stands deservedly well, for it is clear, full of agreeable and apt illustration, and leaves little untouched which is worthy of notice. We must admit, however, our preference for the work of Dr. Jarvis, which we have before us, and which we commend warmly to the attention of instructors for the same reasons that, in the number of this Journal for April, 1846, induced us to speak so highly of his lecture on the Necessity of the Study of Physiology, viz., that it is eminently characterized by strong common sense, original and apt illustration, a thorough acquaintance with the subjects of which he treats, and an originality and freshness, which show that the whole has been thoroughly digested in the author's mind before he sat down to write. It is professedly written for the instruction of youth, and dwells only upon those details of organs and functions, which are necessary to teach mankind the means of preserving health in the daily avocations and exposures of life. It is, therefore, as much a treatise on hygiene as it is on physiology; which, by the way, must be the case with every work on practical physiology. Such being its character, and such its object, it only remains for us, in a medical journal, to state how far it is calculated to give accurate knowledge, and to convey sound principles. From the examination we have made, we would say that the best authorities have been consulted, the most recent developments which science has made have been employed in elucidating the various functions of the system, and discussions on doubtful points are avoided, the author boldly, yet with due caution, adopting those views which best accord with common sense; a characteristic of all his writings. We will now merely indicate the manner or order in which he presents the subjects to the reader. He begins with the nutrition of the body, the want most obvious to every person, treating of digestion and

food, and then following the food converted into nutritious chyle into the circulation, he places before us the vessels and organs connected with the circulation of the blood, and shows how nutrition is effected. The mode in which, and the object for which, respiration is carried on, with the organs by which it is accomplished are next dilated on; then he considers the subject of animal heat, the manner in which it is generated, and the circumstances which affect it. The functions of the skin, and connected with them the use and necessity of clothing and the effects of bathing, are then presented to notice. In the part which treats of the bones and muscles, the circumstances of their growth and uses, the causes of deformities, exercise and rest are passed in review, leaving for the last part the consideration of the brain and nervous system, and of the various interesting points relating to them;—the subject of reproduction, for obvious reasons, is unnoticed. In the concluding chapter, he sums up beautifully the advantages of a careful attention to the laws ordained by a provident Creator for the healthy play of the functions, and the certain consequences of the neglect of these laws in all kinds of discomforts and "little miseries" so hard to bear, and later still in an impaired constitution and positive disease.

The publishers have issued this work in good style, with the exception of a few wood cuts, which mar its fair pages, rather than aid in the conception of the author's ideas. If wood cuts are necessary at all, the difference of cost between good and bad ones cannot be so great as to make the publisher prefer the latter.

C. R. K.

ART. XVII.—*On the Pathology and Treatment of Dysentery; being the Gulstonian Lectures delivered at the College of Physicians, in February*, 1847. By WILLIAM BALY, M. D., Physician to the Millbank Prison, and Lecturer on Forensic Medicine at St. Bartholomew's Hospital. [From the London Medical Gazette.] 8vo. pp. 33: London, 1847.

THESE lectures present a very valuable contribution to the pathology of Dysentery. The ample opportunities which the extensive prevalence of that disease among the prisoners confined in the Millbank Penitentiary, afforded him, have been improved by the author, to investigate with care the true character of the intestinal lesions which constitute its morbid anatomy, and by a comparison of these with those described as occurring in connection with the dysentery of tropical climates, to determine the true relation the latter holds to the disease as it occurs in Europe.

The general result of Dr. Baly's observations goes to show that all the well-marked varieties of structural change in the large intestines, observed in tropical dysentery, are found likewise in fatal cases of the disease occurring in the climate of Great Britain.

In the least severe cases of dysentery, when the life of the patient was cut short, by some other malady, at an early stage of the disease, the morbid changes discovered in the colon or rectum are thus described by the author.

"The solitary glands in some part or other, generally in the rectum and sigmoid flexure of the colon, or in the cœcum, are swollen, forming round prominences on the surface of the mucous membrane, varying in size from a millet seed to a full-sized shot. These prominences are sometimes of a uniform pale red colour; at other times they have a ring of bright redness around their base, or present this evidence of vascular turgescence only at their summit."

"In two other cases, in which the symptoms of dysentery were rather more severe, life was cut short, in the one case on the eleventh day, by the supervention of a spasmodic affection closely resembling tetanus, and in the other case, on the twenty-second day, by pneumonia. Here the swollen solitary glands were surrounded by deeper and more extensive redness, and there was, besides, an evident disorganization of the summits of many of the prominences. These disorganized portions, forming minute yellowish sloughs, could be detached with more or less ease from the surrounding tissue, and in a few instances it was clear

that the small sloughs had become detached before death, and had left small ulcer-like cavities in the spots previously occupied by the enlarged glands.

"The mucous membrane around the glands which exhibit these effects of inflammation, besides being red and tumid, is usually rough, or covered with a thin aphthous layer, which, by microscopic examination, I have found to be composed of particles of epithelium mixed with amorphous matter, probably fibrine. This mere roughness is, I believe, generally due to an altered condition of the epithelial investment previous to its being detached from the *membrana propria*. This roughened state sometimes exists over irregular spaces of a square inch or more in extent; each such patch having upon it two or three enlarged and altered glands."

Dr. Baly would call especial attention to the fact, that the small ulcers which are so commonly met with in all the more advanced stages of dysentery, are produced, at all events in their commencement, by a process of mortification, and not by ulceration.

"The solitary glands of the large intestines, in the acute stage of mild dysentery, cannot easily be shown to have cavities like the agminated and solitary glands of the small intestines found enlarged and inflamed at an early period of continued fever; they seem to be solid masses. But if death does not occur at an early period of the disease, and the inflammatory process owing to neglect of treatment or other causes, assumes the chronic form, then the cavity of each little gland is restored, and becoming much larger than in the healthy condition, secretes an increased quantity of fluid of an abnormal character"—"in some instances transparent, in others opaque and yellowish."

"In cases of dysentery of the *second degree of severity*, the effects of the inflammation are, as in the slighter cases, generally most marked in the solitary glands, of which a large number are affected. The mucous membrane between them, however, is likewise the seat of active inflammation. The glands lose their vitality, and are converted into small sloughs, but the mucous membrane in which they are imbedded is inflamed, and thickened, and is likewise altered on its surface. In the only case seen by Dr. B., which could be referred to the first fortnight's progress of this second degree of dysenteric inflammation, the mucous membrane was, at its surface, evidently converted into a thin lamina of dead tissue, connecting together the deeper sloughs that involved the solitary glands. The dead lamina here spoken of certainly implicated the membrana propria in the intervals of the mouths of the tubular follicles, but from its thinness seemed not to involve any much deeper portion of the mucous membrane. These changes in the solitary glands and the intervening mucous membrane occupied principally the prominences of the transverse rugæ of the colon. The surface of the membrane itself did not present much redness, but the submucous tissue of the rugæ appeared very full of blood when compared with the exsanguine condition of most parts of the body of the patient, who was the subject of phthisis. At a later stage, but while the inflammatory and destructive process still persists, the small sloughs enclosing the solitary glands are found to have been thrown off; the thin superficial layer of the surrounding mucous membrane which had lost its vitality, is also gone, leaving erosions of the surface; and the mucous membrane with the submucous tissue is in most cases much thickened, and turgid with blood and serum. The cavities which contained the sphacelated solitary glands appear as small round ulcers with sharply cut edges, resembling holes made with a punch, and give to the inner surface of the intestine somewhat of the aspect of a worm-eaten piece of wood. The ulcers communicate with each other here and there at their deepest part. In other places they have coalesced in their whole depth; and sometimes large ulcers have been formed, apparently by the destruction of the septa of mucous membrane which had previously separated many small ulcers. When the disease has affected the intestine only partially, the rugæ are the portions especially occupied by the small ulcers; and the large ulcers, when they exist, are almost always seated on the same prominent parts. The small round ulcers, for the most part, do not pass through the cellular coat, but the large ones commonly reach the muscular coat, and occasionally perforate both this and the serous coat."

"In another set of cases of the same degree of severity, the morbid changes found after death have been of a totally different character. The solitary glands

have not apparently suffered more nor perished sooner than the surrounding mucous membrane; consequently no small round ulcers have been formed. But the entire mucous membrane, in larger or smaller tracts, where the inflammation has reached a certain height, has fallen into the state of gangrene, and these gangrenous portions, which are generally seated on the prominent folds of the membrane, subsequently becoming detached, leave large ulcer like excavations."

"Some differences in the appearance of the intestines in which the disease has taken this course, are produced by the age and constitution of the patient, and the period of the disease. In young adults, previously healthy, the mucous membrane around the gangrenous parts is intensely red. In old and feeble persons it is often almost devoid of redness. At an early period of the disease the sloughs are of a dark green colour and firm consistence; at a more advanced stage they are of a yellowish-white colour and firm consistence, and many of them have already become detached, leaving irregular excavations."

"In this form of dysenteric lesion, as well as in those previously described, where the solitary glands are especially affected, the disease attacks by preference the transverse rugæ and other prominent parts of the mucous membrane, the chief exception to this rule being met with in the cœcum, which, though nearly devoid of rugæ, is yet a very frequent seat of dysenteric inflammation; and the ulcers, whatever their size and shape, originate by a process of sloughing, and not by simple ulceration.

"Two forms of structural change, then, attend cases of acute dysentery of the second degree of severity. In the chronic stage they still retain distinctive characters. In the one we have large ulcers of irregular shape, chiefly occupying the situations of the rugæ and longitudinal bands, while, in the other, the predominant feature is constituted by the small round ulcers When the inflammatory action has continued long in a subacute form, the submucous coat in both cases is found much thickened, and at an advanced period of the disease, much indurated in the situation of the ulcers. The contraction of these thickened parts, in the manner of the cicatrices of burns, sometimes is productive of strictures of the intestine."

"Dysentery, in its *most severe degree*, is frequently fatal in a few days. The inflammation affecting a large extent of the mucous membrane, reduces it with extreme rapidity to the state of sphacelus. In the parts most intensely inflamed, the whole mucous membrane is found swollen, and of a dark purple colour, or its texture is disorganized, and its colour black, green, or brown."

"When inflammation of this degree of intensity affects a large extent of the intestine, death generally ensues very speedily. This is not, however, always the case; and when life is prolonged for several weeks, we see further stages of the disease, or perhaps, I should rather say, changes in the parts which the disease has destroyed, viz, the softening and the separation of the sloughs."

"It seems scarcely possible that life should be long maintained with a large portion of the alimentary canal in such a condition as this; but where the gangrenous process has not affected the coats so deeply, the patients survive for some time the loss, by sloughing, of the mucous membrane, and of much of the submucous tissue through more than half the length of the large intestines."

"When the lower part of the intestine is the seat of the disease, in cases of dysentery, a tolerably accurate estimate of the extent of mucous membrane affected may be formed from the mere quantity of bloody mucus discharged. The source of this bloody and mucous discharge in the acute stage of dysentery is not the solitary glands, but the tubular follicles of the mucous membrane." The granular matter contained in the solitary glands, Dr. B. found to be "composed of solid particles of flattened figure and strongly defined outline, resembling the nuclei of certain cells or globules; while the contents of the follicles were found to be, at one time, epithelial particles, at another, round nucleated globules, exactly resembling mucous globules. Now the bloody mucus discharged in dysentery, is composed of such nucleated globules, generally mixed with numerous blood-discs. Sometimes the globules are seen here and there still connected together in a cylindrical mass, such as they form while in the tubular follicle. The puriform matter occasionally discharged in acute dysentery has probably the same source. In the chronic stage of dysentery, also, pus, or a puriform matter, is often excreted. But here this matter seems to have a different source. It probably

comes, in the slighter cases, from the enlarged and diseased solitary glands, and in the more severe cases from the numerous ulcers which have been left after the destruction of the glands, and of smaller or larger portions of the mucous membrane."

The foregoing extracts exhibit a very fair exposition of the anatomical lesions deduced by Dr. Baly, from the fatal cases which occurred at the Millbank Penitentiary, as those attendant upon the different degrees and stages of dysentery.

The whole of the observations of the author in relation to the disease are of a particularly interesting character. His remarks on its etiology deserve especial notice. Dr. Baly refers its production invariably to a malaria arising from the soil, and presents very plausible arguments to prove that such was its cause in the case of the Millbank epidemic; and in the extension of these arguments to prove its constant production in all situations by a telluric gaseous poison, he adduces the close alliance between dysentery and other diseases which are more indisputably of miasmatic origin, namely, common cholera and fever, and the fact that not merely have epidemics of dysentery in the penitentiary been preceded or followed by the prevalence of one or other of these diseases, but that an attack of dysentery has often been ushered in by cholera, or has been combined with fever, particularly typhus and typhoid, in the same patient.

The author's description of the symptoms of dysentery is particularly excellent, and it would have been complete had he, from the facts in his possession, indicated the relative frequency and value of the different morbid phenomena.

The plan of treatment laid down by Dr. Baly does not differ from that recommended by the best authorities upon the therapeutics of the disease.

The chief means that he has found successful in cases marked by the characters of a simple inflammation of the larger bowels, unattended by any morbid state of the system at large, except symptomatic fever, are, free local blood-letting by means of leeches, repeated at intervals of some hours, when the symptoms were urgent, and not readily subdued by the means first used; the administration of calomel and opium, generally in doses of two grains of the former, and one-third or half a grain of the latter every three, four, or six hours, as long as the character of the evacuations and the state of the local and general symptoms indicate the existence of inflammation, or until the state of the gums shows that the system is affected by the mercury.

"Mild aperients, also, have been found most useful in perhaps the majority of the cases, but especially in those where the lower part of the large intestine was the seat of the disease, and where the feces were retained, so that the evacuations consisted almost entirely of mucus tinged or mixed with blood. In these cases, the administration of one, two, or three drachms of castor oil has produced free feculent evacuations, and has afforded great relief to the symptoms. The beneficial effect produced by the action of this mild aperient medicine has often been very remarkable, greater than I know how to explain; while evil seemed always to result from allowing more than twelve hours to pass without obtaining a free feculent evacuation, if the frequent discharge of bloody mucus, and other signs, still indicated the persistence of inflammation. In many cases, however, no aperients whatever were required, free discharges of the feculent contents of the bowels taking place spontaneously. Indeed, where the cœcum and ascending colon were the seat of the disease, the active stage of the inflammation was almost always attended with copious discharges of liquid feces, and the subsidence of the inflammation was in great measure evidenced by the less frequent occurrence of these discharges, and their less liquid character. Very rarely, indeed, was a more active purgative than castor oil found requisite in the acute stages of dysentery. In some instances, owing to the irritable state of the stomach, small doses of saline purgatives have been substituted for the castor oil, but whenever they have acted with much violence they seemed to do harm."

"Calomel, even in small doses, and combined with opium, has, in some cases, increased the irritation of the large intestine; great advantage has then resulted from substituting for the calomel the gray mercury with chalk, of the Pharmacopœia, in combination with Dover's powder.

"When the symptomatic feverishness was considerable, the skin was generally dry as well as hot, and then some benefit has been derived from the use of anti-

mony, ipecacuanha, and other diaphoretic remedies. But ipecacuanha has wholly failed in Dr. B's hands as a specific, or in any way active, remedy for the disease."

The local blood-letting, the calomel and opium, and the mild aperients, were the remedies to which the physician looked for the cure of the disease. But there were other remedial means from which the patients in many cases derived more sensible relief from their sufferings. To these means, however, of which the principal were opiate enemata to relieve the tenesmus, large warm poultices to the whole abdomen, and medicines to allay symptomatic vomiting, Dr. B. merely alludes. He remarks that whenever, from the age or debility of the patient, it appeared desirable to give moderate quantities of a stimulant, such as brandy, no harm ever resulted from its use. On the contrary, a beneficial effect, we are told, was produced, however active the local inflammation might be.

"It may be thought," remarks Dr. B., "that this was owing to the prisoners having been weak from long-continued confinement. But there was no strongly marked sign of such weakness, and, when general blood-letting appeared to be called for, it was borne well. Indeed, the principal reason for preferring local blood-letting, even in severe cases, was that it seemed to be more efficacious, and not that any symptoms contraindicated general depletion."

"I need scarcely say," Dr. B. observes, "that the diet allowed in the earlier stage of dysentery, consisted merely of milk and farinaceous articles of food."

D. F. C.

ART. XVIII.—*Cholera, Dysentery, and Fever, Pathologically and Practically Considered; or the Nature, Causes, Connection, and Treatment of these Diseases, in all their Forms.* By CHARLES SEARLE, M. D., M. R., C. S. E., &c. &c. 12mo. pp. 120: London, 1847.

DR. SEARLE will unquestionably deserve the gratitude of every student of medicine, for even this attempt to compress within eighty duodecimo pages, printed in a type so large that almost the feeblest eyes may read it—the entire etiology, symptomatology, pathology, and therapeutics of some of the most important diseases which the physician is called upon to treat, and this too in a style professedly adapted to the comprehension of the unprofessional as of the professional reader. That the author has attempted all this, he has himself expressly declared. —Thus, in his Introduction, he states,

"In the construction of this treatise, I have endeavoured, in the few pages of which it is composed, to embody, in a style which may be understood by all classes, a comprehensive view of cholera in all its bearings. First, as regards its nature; then its most frequent causes, and the operation of those causes in developing the symptoms; next the indications of cure, as pointed out to us by Nature, and after this, the remedies which principle directs and experience has proved to be most successful in its treatment. This is followed by a detailed account of the practice which should be pursued, from the first moment of visitation, and through the various stages of the disease, in all its forms, from simple diarrhœa to its severest species, including that, also, of dysentery; and, subsequently, the treatment of the inflammatory febrile affection which so frequently succeeds to the attack of cholera, is also particularized, thus rendering the whole a complete, though concise, treatise on the subject, practically available to every person, professional or otherwise, in the hour of necessity. This is followed by the subject of fever, in which I have explained its phenomena, or pathology, its varied character, as modified by its numerous causes and the diversified circumstances under which it exhibits itself; occurring either as simple continued fever—as an effect of cold, or of influenza, bilious fever, scarlet fever, erysipelas, rheumatic fever, typhus fever, &c. &c., and with respect to all of which I have endeavoured clearly to explain."

"Upon the subject of fever, I trust it will be found that I have robbed this 'will-o'-the-wisp' of its proteiform disguise, and exhibited it in its unsophisticated character, not, as Broussais and Clutterbuck have taught, as the consequence or effect,

at all times, of inflammation, but as a reality in itself—a condition of the circulating system, which I have denominated that of *irritation*—an excited condition of the small vessels, intermediate between that of active inflammation, and the passive condition of congestive repletion,—a condition of the general system which may be brought about by a great variety of causes, but all referable to two distinct heads, which afford the two leading principles of treatment applicable to all cases."

The work before us, viewed as a mere catalogue of the author's general conclusions, in regard to the nature, relations, and treatment of the diseases enumerated—as the simple outline of his pathological and therapeutical views—is not without interest. His suggestions are often plausible—sometimes probably correct. But he has certainly failed to prove anything—to reason out or support by facts the theories he presents, or the correctness of the practice he directs. Often his positions are the simple expression of mere truisms, without an attempt at explanation—without adding a single mite to our knowledge. Take for instance, the following.

"I may venture, without fear of contradiction, to say, that the influencing cause (of epidemic cholera), consists in some condition of the atmosphere, which operates by reducing the active powers of the system, and subverting the normal or natural healthy manifestations of life, and may, therefore, without impropriety, be called poisonous."

In some instances, Dr. Searle, however, is more definite in his exposition of the causes of disease, and what has occasioned to others much doubt, and in relation to which they have not been able to arrive, after the closest investigation, at anything like a positive conclusion, he settles in a few words.—Thus of malaria, speaking of sporadic cholera, cases of which are of frequent occurrence in autumn, "from the combined influence of debility of the system, and derangement of the biliary and associated organs, which so generally ensue from the preceding hot weather,—and malaria, which, at that season, is so much more abundantly developed by the agency of heat, and issues from drains, sewers, or wherever animal or vegetable substances exist in process of decay; its effects being, however, more particularly manifested in damp, filthy, low, or confined situations,—the individual in the condition of predisposition to disease above mentioned, being exposed to its influence, and inhaling such malaria, having his blood, it may be said, truly poisoned thereby."

But what is this malaria—the nature and character of which have been so long inquired after, by a host of medical philosophers in vain? Hear Dr. Searle—

"Sulphuretted hydrogen, one of the offensive gases issuing from sewers, and a product of the decomposition of animal and vegetable substances, is so truly poisonous to the animal system, that a bird, or other small animal, exposed to an atmosphere containing but one fifteen hundredth part of this gas, dies almost immediately from its effects; and a horse has been killed by exposing it to breathe an atmosphere containing but one-two hundredth and fiftieth part. That malaria, which is a compound of this and some other gases equally noxious, developed by the decomposition of animal and vegetable substances, wherever they exist, may be truly affirmed to be a poison; and which under certain conditions of the atmosphere and states of the system, will produce cholera; and under other circumstances of exposure to its influence, will occasion typhus fever, dysentery, scarlet fever, erysipelas, rheumatic fever, influenza, or other modification of fever of a remitting type with local affection—either of the brain, lungs, or abdominal organs. The various states of the system, age, season of the year, condition of the atmosphere, composition of the malaria, its virulence, and length of time the individual may have been exposed to its influence—all being modifying circumstances influencing the results, or disease, to which it gives rise."

So much for the author's views of the etiology of disease. The manner in which malaria acts in the production of disease, is by subverting the vital process of calorification; by diminishing the vital combustion, and reducing thereby the active energies of the system—calorification being, according to Dr. Searle, the primum mobile, or mainspring of all the functions.

"The heart's power being thus reduced, the blood is not freely circulated, and stagnation, or congestive accumulation of blood in certain of the vessels takes

place, and in those vessels more particularly in which the circulation is most feeble, or those the most remote from the heart's influence—or power of keeping the blood they contain in free circulation, and which is most especially the case in the veins of the stomach, bowels, liver, and spleen; and here, accordingly, stagnation of blood, or congestive fullness of the vessels, more particularly occurs."

The engorged and over distended vessels of the stomach and bowels, cause an exudation or pouring out into the alimentary canal, of the aqueous portions of the blood, or a portion of their more fluid contents.—Hence the watery evacuations in cholera; which are colourless, because the congested state of the liver prevents the secretion of bile. The cold profuse sweating in cholera, is the result of a simple exudation from the congested vessels, of the surface of the body.

Diarrhœa is, according to Dr. Searle, the result of a similar congestion of the vessels of the intestines—though less in extent—to that which takes place in cholera.

If the case of cholera be a protracted one—the watery purgings, with general inertia, cold, and depression of the circulation—will be followed by gastro-enteritis—indicated by its distinctive symptoms.

"The characters of the aforesaid symptoms," remarks Dr. Searle, "should be clearly understood: they consist of a sub-acute inflammation of the mucous membrane of the congested bowels, developed by the stagnant blood in the veins of the parts retarding the blood in its passage from the arteries, and thereby distending the latter, and exciting them into inflammation. This inflammation of the bowels implicates the lining membrane of the stomach also, and extends, if the patient live long enough, by means of the biliary duct, which opens into the bowels, to the liver also—to the extent, at least, of producing irritation, and the excitement of increased secretion of the bilious fluid: and the fever, which attends it, is developed in the same manner, that is, by the congestion of the venous system in general, retarding the blood in its passage from the capillary arteries, and exciting them, by reason of their distension, to irritation, or a condition of increased action—but short of that which exists in inflammation, and which, as constituting fever, will take place or not, as there may be power sufficient in the system, or the blood possess the requsite amount of oxygen and excitable qualities for the purpose."

Diarrhœa, according to Dr. Searle, is the mildest and most prevalent form of disease, resulting from the united influence of heat and malaria, followed by the conspiring one of cold, or other concomitant circumstance.—Dysentery is another variety, and the congestive typhus of Armstrong another—the latter being intrinsically the same disease as cholera, modified by climate, and is the form in which, perhaps, in its severest degree, it more frequently manifests itself in England.

"If fever and cholera both take place from the same cause—malaria—it may be asked, what constitutes their difference? In reply, I would say—in the operation of that cause; its amount, virulence, and intensity, as aided by concurrent circumstances! Thus, we see fever with dysentery symptoms, lapsing—by the accessory agency or augmentation of depressing causes—as a humid state of the atmosphere, an attack of indigestion or the like—into cholera. The condition of the system in the latter case, being that in reality of the cold stage of fever, in augmented degree. The native energies of the system being too much prostrated, by the extent of the cause, to bring about the reaction of the febrile condition; and hence the fact—that in the process of successful treatment, as amendment takes place, febrile action is developed."

"The disease above noticed, is in reality nothing more than the ordinary form of remittent or malarial fever of tropical climates, but to which it is by no means peculiar, it being the disease to which travellers are exposed during the summer months in the Italian States, the islands and shores of the Mediterranean, the banks of the Rhine, and as prevalent in France, Spain, Portugal, and during the autumnal months in England; and which malarial fever, when attended with bilious vomiting, or pain in the side or head, is often called bilious fever; and which, moreover, under particular circumstances, gives occasion not only to inflammation of the stomach and bowels, or symptoms of gastro-enteritis and dysentery, but also, under other circumstances or states of the system, to other local

inflammations of the membranous structure—such as of the joints, the knee, wrists, or other, occasioning pain and swelling of the part, and thus developing rheumatic fever; or of the membranes of the brain, then constituting brain fever; or, as I have often known in India, the same cause affecting the membranous coats of the eye, and occasioning muco-purulent ophthalmia, or the inflammation of the eye common to Egypt; or the malarial cause may give rise to a condition of *irritation*, or a less perfectly developed form of inflammation of the membranes of the brain, or spinal marrow, or sheaths of the nerves, and occasion then all the varieties of neuralgia (or nervous pain), and spasmodic attack, as sciatica, tic-doloureux, epilepsy," &c.

After a rapid sketch of the pathology and principles of treatment of intermittent and remittent fever, fever from cold, with local inflammation,—all comprised in seven pages—the author presents us with the following general summary—

"Thus, if to the cause of intermittent fever—malarial impregnation of the blood, there be superadded, as an effect of heat—congestive fullness of the liver or bowels, and derangement of the associated organs; or the same symptoms as effects succeeding to cold, there will in either case be, more or less pain in the region of these organs, sickness of stomach, and inflammatory irritation evinced, modifying, in a greater or less degree, the febrile attack; or, if these symptoms exist in a preponderating proportion, they may obscure or mask the intermittent febrile one altogether; and thus, in proportion to the predisposing circumstances and constitutional disturbance which pre-exists, augmented in amount by the supervention of the malarial disease, a simple intermittent fever, or such as would ensue in a more healthy individual, is converted into a remittent, or a graver form of disease, with local inflammation and complexities daily augmenting in number, if the disease be not by timely means arrested: and thus are typhus and the graver forms of fever developed. And now, with reference to the *predisposing circumstances* and character of the attendant symptoms; in a man of intemperate habits, or another with congestive fullness of the liver and bowels, the excitement of fever succeeding to the malarial cause, will develop bilious vomiting, or inflammation of the liver, with pain in the side and difficulty of breathing; or inflammation of the stomach and bowels, or dysentery; or, in Europe, where cold is simultaneously in operation, and the lungs and air passages in consequence exposed to affection, inflammation of the lungs, or bronchitis; or the throat, as in scarlatina—will be more particularly affected, and thus will the fever be modified in character by the organ affected, and function it fulfils. The head also, is frequently affected; the brain, especially in persons who suffer from care and anxiety, perturbation, or excess of mental employment, and not less so in young children, is very frequently affected; and thus the pain or giddiness of congestion of the brain, or the delirium of excitement, which so frequently attends this form of fever. And again, as I have elsewhere said, in persons of a rheumatic or gouty tendency, swelling and inflammation of the joints, one or more, and often migrating from one to the other as from the knee to the wrist, or elsewhere, ensue; or, as I have known in India, and seen prominently in the garrison of Vellore, men going on duty as sentinels at night, and returning from guard in the morning, with their eyelids swollen and extremely painful, and the most inveterate form of muco-purulent ophthalmia follow as a consequence. And again in this country, from some no less obscure agency, or modifying circumstances, developing erysipelas. And I may mention also, women in childbed, its developing fever, or otherwise modifying the character of the inflammation of the peritoneum, or uterus, which is apt to succeed. And to this catalogue of malarial fevers, I might add many others—malaria being the ordinary exciting cause, I believe, of influenza, modifying the usual effects of cold, and developing this now too frequent affection."

"And lastly, I may observe, to the development of the graver affection of typhus fever, we have only to look to the locality in which it is more frequently to be found, and the class of individuals more commonly the subjects of its attacks, to discern that it is a disease made up of an assemblage of the aforenamed elements, developed by cold, malaria, unwholesome diet, and deranged secretions, simultaneously or successively operating; one class of symptoms preponderating in one season, or under certain especial circumstances of its visitation—and another group in another, under different limitations; and thus, at one period, to be remedied by

calomel, diaphoretics, and evacuants more particularly; and at another period by quinine and stimulants, or under ordinary circumstances, by both timously employed. Its treatment in general, should bear reference to the preponderating symptoms at the time being, bearing ever in view the leading feature or fact in the case—that the disease is essentially based upon debility! The excitement of organs or inflammation present, being not the cause, but the consequence of fever and of general derangement,—a fact that must be ever borne in mind, and influence us in the whole class of malarial and remittent types of fever; and especially so, with regard to blood-letting, which, in relief of general fever and local inflammation, however properly it may be had recourse to at the early period of the disease, can seldom be practised with impunity at a later period; leeches, followed by a blister, are, therefore, the more appropriate remedies in these cases."

The foregoing extract, which occupies three pages and a half of Dr. Searle's treatise, will give to our readers a tolerably correct idea of the pathological views inculcated by the author. Some may conclude, that we have given too much space to an exposition of them. We have been desirous of doing justice to the work before us, and of allowing Dr. Searle to explain his doctrines, as far as we were able, in his own words. He believes, that his opinions in regard to cholera, are "as deserving of respect, as those of any man living"—while he trusts, that in respect to fever, he has "stripped it of its protean disguise, and advanced sufficient reasons why his opinions on this subject, also, have more than ordinary claim to attention."

We feel no disposition to attempt the refutation of, or to undervalue in the least, the pathological or therapeutical views of the author. There is much in relation to both which we approve. Dr. Searle has, however, in our opinion, made a few very great mistakes; first, in attempting to compress too much in too small a compass; secondly, in addressing his work to the unprofessional as well as to the professional public; and thirdly, in merely setting down his opinions in regard to the nature, causes, and connection of disease, without attempting to reason out these opinions, or adducing the series of facts by which their accuracy is established. His explanations are often the expression of mere truisms, and do not advance us the least towards a knowledge of the subjects to which they refer, while, occasionally, he presents as an established truth what is still matter of dispute, or at best merely a probable conjecture, to be proved or disproved by future observations.

Dr. Searle calls upon "the press generally, to aid him in the circulation" of his treatise, while "at the same time, he calls upon the profession and *all mankind* either to confute him in argument, or to exhibit by facts, reasons why the practice enjoined, and treatment recommended, should not be accepted as *deserving universal adoption!*" We really do not believe that the work before us possesses such transcendent merit as to require us to make any very particular exertion to aid in its circulation. The pathological views of the author will not, in all their details, bear, we fear, the test of a very strict examination, and although his therapeutical directions are, generally speaking, judicious, still we cannot in truth say that they are so perfect as to deserve universal adoption. D. F. C.

Art. XIX.—*The Practice of Medicine: a Treatise on Special Pathology and Therapeutics.* By Robley Dunglison, M. D., &c. &c. Third edition, 2 vols. 8vo: pp. 767–704. Philadelphia, Lea & Blanchard.

The work of Dr. Dunglison is too well known to require at our hands, at the present time, an analysis of its contents, or any exposition of the manner in which the author has treated the several subjects embraced in it. The call for a third edition within five years from the appearance of the first, is, of itself, a sufficient evidence of the opinion formed of it by the medical profession of our country. That it is well adapted as a text-book for the use of the student, and at the same time as a book of reference for the practitioner, is very generally admitted; in both points of view, for accuracy and completeness, it will bear a very advan-

tageous comparison with any of the numerous cotemporary publications on the practice of medicine, that have appeared in this country or in Europe.

The edition before us bears the evidence of the author's untiring industry, his familiarity with the various additions which are constantly being made to our pathological and therapeutical knowledge, and his impartiality in crediting the general sources from which his materials have been derived. Several pathological affections, omitted in the former editions, are inserted in the present, while every portion of the work has undergone a very thorough revision. It may with truth be said, that nothing of importance that has been recorded since the publication of the last edition, has escaped the attention of the author; the present edition, may, therefore, be regarded as an adequate exponent of the existing condition of knowledge on the important departments of medicine of which it treats.

D. F. C.

Art. XX.—*Tracts on Generation.* Translated from the German. By C. R. Gilman, M. D., Prof. of Obstet., College of Phys. and Surg., New York, and Theodore Tellkampff, M. D., Gebhard Professor, Columbia College. No. I.—*Proofs that the Periodic Maturation and Discharge of Ova are, in the Mammalia and the Human Female, independent of Coition, as a first condition of their Propagation.* By T. L. G. Bischoff, M. D., Prof. of Physiology, &c, Giessen. 8vo. pp. 65: Samuel S. & William Wood, New York, 1847.

Upon the suggestion of Prof. Agassiz, the translators were induced to render into English this valuable pamphlet of Dr. Bischoff, a pamphlet justly commended by Prof. A. as "*a model in this kind of experiments.*" In this opinion we cannot but concur, as we have already not only expressed our admiration of it, but, as will be seen by reference to the number of this Journal for January, 1845, have made it, chiefly, and the work of Pouchet and Raciborski, the basis of an extended notice of the new theory of the spontaneous and periodic evolution and discharge of ova in all the mammalia,—a fact which the translators appear to have overlooked; so that not only the conclusions of the author, but his mode of experimenting, have been known here for three years past.

The translation is well done, faithfully representing the author's views and opinions; and we sincerely hope that the translators may be encouraged by liberal patronage to go on in the good work they have commenced, that of continuing the series of tracts, with translations of other interesting and original monographs, on the subject of generation. The aid of Prof. Agassiz is promised them in making their selection, a guarantee that it will be judicious.

The typography and paper are unusually good.

C. R. K.

Art. XXI.—*Obstetric Tables: Comprising Graphic Illustrations, with Descriptions and Practical Remarks, exhibiting, on dissected plates, many important subjects in Midwifery.* By G. Spratt, Surgeon-Accoucheur. First American Edition, from the Fourth and greatly-improved London Edition, carefully revised, and with additional notes and plates. 4to: Wagner & McGuigan, Philadelphia, 1847.

The object and general character of the present publication are fully set forth in the title-page. It comprises nine plates, illustrating the anatomy of the female organs of generation; the general form and structure of the pelvis, and some of the most common deformities to which it is liable; the anatomy of the uterus and its appendages, and the changes in form and position it undergoes during the several stages of pregnancy; the progressive development of the ovum and fœtus; the presentation of the fœtal head; the operation of turning; the application of instruments, and the Cæsarian operation. These plates are all accurately drawn lithographs; many of them, on a well-devised dissected plan, exhibiting, with tolerable correctness, the relations of, and the progressive changes in, the objects they represent. The obstetric tables of Mr. Spratt are certainly well adapted, so far as any

work of the kind can be, to aid the student of Midwifery in acquiring much useful knowledge, and to recall to the mind of the young practitioner, subjects of which his recollections are liable to become obscured or confused, unless occasionally revived by plates, models, preparations, or some appropriate apparatus.

The work, like every other of a similar character, however unexceptionable in point of execution, can be viewed only as an aid to study, and not as the sole means of acquiring a knowledge of the subjects to which it relates. It is only when used as an assistant to the more direct means of investigating the structure of the organs concerned in conception, pregnancy, and parturition, the mechanism and progress of labour, and the proper application of manual assistance to aid or supersede the natural powers in the delivery of the child, when these are insufficient, that works of this kind can be considered as serviceable or proper.

The descriptions of the objects delineated in the tables before us, are clear and accurate, and the concise practical directions and remarks, contained in the text, sound and judicious. D. F. C.

ART. XXII.—*Principles of Human Physiology, with their Chief Applications to Pathology, Hygiene, and Forensic Medicine.* By WILLIAM B. CARPENTER, M. D., F. R. S., Fullerian Professor of Physiology in the Royal Institution of Great Britain, &c. &c. Third American, from the last London Edition; with Notes and Additions, by MEREDITH CLYMER, M. D, &c. &c., with three hundred and seventeen Wood Cuts, and other Illustrations. Philadelphia, Lea & Blanchard, 1847: 8vo. pp. 752.

THE exposition of the Principles of Human Physiology by Dr. Carpenter, has been too long before the public, and its merits too accurately appreciated to render it necessary for us, on the occasion of this new edition, to add anything to the commendation we felt it our duty to bestow upon the work on its first appearance. The very faithful and finished outline which the author has presented of the present state of Physiology, will always render these elements a favourite manual for the study of that science. In the edition before us, every portion of the work has been carefully and thoroughly revised. While Dr. Carpenter has been careful to incorporate all the important additions that have been made to Physiology, since the appearance of the preceding edition, he has entirely remodelled a large portion of it.

"Among the principal additions, will be found a chapter on the varieties of the Human Race, intended to convey to those, who have not time or opportunity to peruse Dr. Prichard's elaborate treatises, a general view of his arguments and conclusions. The account of the primary tissues, also, which was formerly included in the chapter on Nutrition, has been extended in a degree commensurate with the author's estimate of its importance, and has been made to form a distinct chapter, nearer the commencement of the work. Other additions and changes, which constitute, when taken collectively, no inconsiderable proportion of the entire treatise, are scattered through the volume."

The American editor has very ably performed his task. Of the value of the notes added by him to the former editions of the work, the fact of many of them having been incorporated by the author in the text of the present, is sufficient evidence. The new matter added to the edition before us, by Dr. Clymer, enhances very materially its value—they are chiefly such as the rapid advance of Physiology demanded in order to bring the work up to the present day.

A considerable number of new wood-cut illustrations have been introduced by the author. Many of them from original drawings. The editor has likewise added numerous additional illustrations, very accurately and beautifully illustrated.

We can with great confidence, recommend the present edition of the Elements of Dr. Carpenter, as a faithful representation of the actual condition of Physiological science; sufficiently clear and compendious to adapt it for the use of the student—and sufficiently practical in its tendency to lead its readers to the useful application of the facts and principles it places before them. D. F. C.

ART. XXIII.—*Females and their Diseases; a Series of Letters to his Class.* By CHARLES D. MEIGS, M. D., Prof. Midwifery, and Diseases of Women and Children, in Jefferson Med. College, &c. &c. &c. Philadelphia, Lea & Blanchard, 1847: pp. 670, 8vo.

THE late period at which this volume reached us, prevents our doing more than merely announcing its publication, and noticing the beautiful manner in which it has been got up. The position, reputation and experience of the author claim for anything which emanates from his pen, a respectful consideration, and we shall devote some space in our next number to an exposition and examination of the contents of this work.

ART. XXIV.—*The American Medical Almanac for* 1848: *Containing Statistics of the Various Medical Colleges, Hospitals, Dispensaries, &c. &c. of the United States; together with other Information of Value to the Physician and Student.* Philadelphia, Lindsay & Blakiston: pp. 224, 12mo.

THE design of this publication is to present "a condensed view of the condition of the Medical Schools of the United States, with their means of imparting medical instruction, with some account of the various hospitals, dispensaries, asylums, and other medical institutions of the country, and such other miscellaneous information as may be thought useful or interesting to medical men." Though this design has been very imperfectly carried out,—no mention, for instance, being made of two of the four hospitals of our own city,—still the volume contains much interesting information, and is deserving of patronage. We would urge upon the various Medical Institutions of the country, the propriety of furnishing the editor the information he has solicited, so as to enable him to render the volume for next year more complete. We must also express the hope that hereafter the volume will be accompanied by an index to facilitate reference.

ART. XXV.—*Summary of the Transactions of the College of Physicians of Philadelphia.* From June to November, 1847, inclusive. No. 3, vol. ii.: pp. 46, 8vo.

The present number of the proceedings of the college, contains, among other matters, a summary of some interesting discussions relative to the typhus fever which prevailed, to some extent, during the past year, and the annual Report on Surgery by Dr. Isaac Parrish. This last is devoted, exclusively, to the subject of Ethereal Inhalation, and is drawn up with marked ability; but we regret we cannot add with equal impartiality. The philanthropy of the author seems to have taken fire at the idea of our possessing a means of preserving patients from the pains of the surgeon's knife, and instead of a cool, philosophic, and impartial investigation into the powers of ether, its efficiency and safety, he has given us an eloquent eulogy—all the vaunted effects of the article are painted in the most glowing colours—whilst its asserted ill effects are explained away, or glossed over, or omitted. We have not space, however, to discuss this subject, nor do we feel, as yet, at all prepared to do so. We must content ourselves, at present, with collecting the materials as they are brought to light, which will hereafter enable us to form a judgment relative to the effects of ethereal inhalation, the safety and propriety of resorting to it, and particular cases to which it is applicable.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On the Principle of Vital Affinity, as illustrated by recent Observations in Organic Chemistry.* By Dr. Alison, Professor of the Practice of Physic in the University of Edinburgh.—The objects of this paper are, *first*, to vindicate the use of the term affinity, and assert the principle which that term is intended to express, viz., that in living bodies ordinary chemical affinities undergo a certain change or modification, either by the addition of affinities peculiar to the living state, or the suspension of some of those which act elsewhere; and, *secondly*, to attempt, from a review of facts recently ascertained, an exposition of the laws, according to which these modifications of ordinary chemical affinities take place, and a discrimination of those changes in living bodies, which may be ascribed to them.

In proof of the first of these points, the author referred particularly to the facts known as to the formation of starch, or its allied compounds, from carbonic acid and water, by an action of certain parts of living vegetables under the influence of light, whereby the carbonic acid is decomposed and oxygen evolved; maintaining that this change, essential to the condition of all organized bodies, is so distinctly at variance with the ordinary chemical relations of carbon and oxygen, and even with those which show themselves in other parts of vegetables in the living state, and in all parts in the dead state—that we are equally bound to regard it as a strictly vital phenomenon, as the contraction of a muscle on a stimulus: and that we cannot rightly apprehend either phenomenon unless we regard them as dependent on certain laws of vital action or of vitality.

On the second point, he observed, that the physiologist is concerned only with those formations and resolutions of organic compounds which take place in the interior of living bodies, and that, premising that the first introduction of every species of organized being into the world must have been by a miraculous interposition of Divine Power, beyond the limits of scientific inquiry, the objects of investigation in this department of physiology appear to be more definite, and the strictly vital affinities which now operate, from the commencement of the life of vegetables to the death and decomposition of animals, to be fewer and simpler than had generally been supposed.

I. The first kind of action which may be ascribed to vital affinity, he described as the mere selection and retention, by certain portions of a solid, of certain substances, whether elementary or compound, already existing in a fluid that is brought in contact with it, or what is called by some a chemical filtration. This power is exemplified in living vegetables, particularly in the appropriation by them of some of the earthy and saline matters which are brought to their roots, and the rejection of others; it is more strikingly seen in the development of the lower classes of animals, especially those of the radiata and mollusca, which have horny or earthy integuments; and it is certainly the chief power concerned in all

those functions of animals, to which we give the names of absorption, secretion, and even nutrition.

In regard to this simplest form of vital affinity, the following points seem ascertained:—

1. That it is usually, if not always, performed in a perfect organized being, by an attractive agency of living or growing cells, which seem always to perform the double office of extracting from the nourishing fluid the material of their own growth and reproduction, and extracting also the fluid or solid matter which they are to contain, or with which they are to be incrusted.

The matters thus consolidated from a fluid in which they previously existed, by a simple process of attraction and increased aggregation, not precipitated by any chemical separation of their component parts, assume the forms peculiar to each organized body to which they are thus added, but retain that peculiarity which in organic matter exists only in fluids—that the smallest portion of them contains all the chemical ingredients which belong to the mass, and thus any crystalline arrangement is prevented.

2. That no difference of form, or of composition, can be detected in the different cells of an organized structure, to explain the difference of the matters which they thus extract; and that, in the first development of organized beings, the difference of selecting power exercised at different points of the germinal membrane, appears to be determined by no other condition than their *position*—just as different portions of nervous matter, differing only in anatomical position, exert perfectly different vital powers, or, in the state of disease, (*e. g.* of inflammation,) peculiar attractions and repulsions appear to exist, for a time, simply at particular spots of the vascular system.

The attractions by which living cells thus appropriate to themselves portions of contiguous fluid, are obviously analogous to those by which even inorganic porous substances attract different fluids with different degrees of force, and thereby produce the phenomena of endosmose and exosmose, but are broadly distinguished from them by the peculiarity of the changes thus effected, by their infinite variety, even in different parts of the same structure, and by their uniformly temporary existence.

II. The actual transformations, or new arrangements of the chemical elements which take place in living bodies, and are peculiar to them, are illustrated by the examples of the formation of starch from water and carbonic acid, oxygen escaping; and of the formation of fat from starch, carbonic acid and water escaping.

It appears to be in the *cells* of organized structures that those transformations are likewise effected; and as the action of cells in simply extracting portions of the nourishing fluid, is analogous to the physical principle of endosmose, so their action in these metamorphoses may be illustrated, but by no means explained, by comparing them to those chemical actions to which the term catalysis is applied.

Two general observations may be made on both these modifications of the power of vital affinity—*first*, that they are obviously *transferred* from the portions of matter already endowed with them, to those which, in the growth of living beings, are added to, or substituted for, those portions of matter; just as muscular fibres already existing, communicate to all the matter which is added to them by the process of nutrition, the same contractile properties which they themselves possess; *secondly*, that every portion of matter to which any such vital properties are imparted, appears to enjoy them only for a short time; losing them so rapidly that a vital process of absorption and excretion is necessary, throughout the whole existence at least of animals, to eliminate from their bodies materials which have lost these properties and reverted to the condition of dead matter.

After stating these general principles regarding vital affinities, the author made some more special remarks on the most fundamental of all the changes in organized beings which may be referred to their action, viz., the formation of starch and its allied compounds from carbonic acid and water under the influence of light, and consequent purification of the atmosphere; and he insisted chiefly on the following points:—

1. That this change is probably gradual; the carbonic acid being taken into the juices of the plant and slowly decomposed there, more or less completely, accord-

ing to circumstances, whence result not only starch, or its allied compounds, but likewise different organic acids and various oils.

2. That the formation of sugar in plants is probably to be regarded rather as a simply chemical action than as a result of vital affinities; or that it is a first product of the decomposition of starch by the agency of water and oxygen.

3. That, on the other hand, the formation of lignin, containing more carbon and less oxygen, from starch or from cellulose, and from the carbonic acid and water brought into the cells, appears to be the result of a strictly vital affinity, strongest at the period of greatest vigour of the plant.

4. That in this, as in other of the metamorphoses which take place in living beings, and which he proposes farther to examine, the carbon, thus originally fixed on the earth's surface from the atmosphere, appears to be the chief material employed by nature for the formation of all organized structures, and to be invested, for that purpose, with peculiar and transient vital affinities, while oxygen hardly appears to exert any chemical powers in living bodies, different from those which it manifests elsewhere; but is taken into the interior of all living bodies, only that it may support the excretions which are continually going on in them, and resolving organized into inorganic matter; and thus, that it gradually resumes its power over the carbon which had been temporarily separated from it for the formation of the animated part of creation.—*Proceedings of the Royal Society of Edinburgh*, 1846.

—

2. *On the Nature of Tetanus caused by Strychnine.* By Prof. Hermann Meyer, of Zurich.—The tetanic convulsions, which follow the exhibition of Strychnine, are well known; as also the fact that these convulsions can be readily excited as reflex movements. The general use of strychnine in experiments on the nervous system is very much based on the knowledge of these facts, and invites to a discussion of the question as to the mode in which the tetanus originates. The following experiments were instituted for this purpose.

Exp. I. The crural nerve of a frog, suffering from convulsions induced by strychnine, was divided; these immediately ceased in the limb.

Exp. II. No convulsions took place in a limb, in which the nerve had been divided previous to the exhibition of the poison.

From these well known experiments, it follows that the originating cause of the convulsions must be sought for in the central parts of the nervous system. But the question ensues, does the tetanus originate from an affection of an individual portion of the central organ, or in an affection of every individual portion? The following experiments, also somewhat well known, tend to throw some light on the subject.

Exp. III. The brain was removed from a frog; tetanus ensued in the trunk.

Exp. IV. Brain and cerebellum removed, result as in the preceding.

Exp. V. Medulla oblongata removed; same result.

Exp. VI. Medulla oblongata divided; general tetanus ensued.

Exp. VII. The spinal marrow was removed posterior to the giving off of the nerves to the anterior extremities; result as in the preceding case.

From these experiments, it follows that the origin of the tetanus is to be sought for in some cause common to all the central organs of the nervous system. The following experiments show what this cause is.

Exp. VIII. The posterior column of the entire spinal marrow was removed from a frog by means of a fine pair of scissors. A solution of strychnine was then either exhibited by the mouth, or applied directly to the spinal cord. Convulsions occurred only in the jaws and eyes.

Exp. IX. The posterior column of that part of the cord giving off nerves to the posterior extremities was removed. Tetanus occurred only in the head and anterior extremities.

Exp. X. The same portion of cord giving off nerves to the anterior extremities, was removed. Tetanus occurred only in the head and posterior extremities.

From these experiments, the author thinks himself entitled to conclude, that the presence of the motor nerves, even though uninjured, does not suffice to produce tetanus; but that there must also be an uninterrupted connection of the sensory and motor fibres within the central part of the nervous system. The only motions,

however, which we recognize as dependent on the sensory fibres, are those which we know to be the cause of reflex movements. The above experiments, therefore, would lead to the conclusion, that tetanus caused by strychnine arises entirely from general reflex movements, and that the action of the strychnine not only excites the motor fibres, but goes to increase the necessary cause from which reflex movements arise. If this be true, tetanus must cease, even when the spinal marrow is uninjured, provided the conditions under which reflex movements arise are removed. In order to test this, the following experiments were instituted:—

Exp. XI. The skin of a frog was rubbed over with strong prussic acid (30 per cent.), so that the superficial peripheral extremities of the nerves were paralyzed. Strychnine was exhibited; no tetanus ensued, except when the animal was strongly shaken (thrown about, for example).

Exp. XII. After laying open the spine of a frog, the posterior nervous roots were divided. Same result as above, or as when the posterior column of the cord was irritated with a needle.

Exp. XIII. The same experiment was repeated in a frog in which tetanus was present; it ceased immediately on division of the posterior roots, and only recurred under the conditions first stated.

From these experiments, then, it may be concluded, that tetanus arising from the action of strychnine originates entirely and alone from reflex movements produced by the strychnine, exciting to increased action the primary cause of the reflex motions themselves.

The next question that occurs is, what is the primary cause of these reflex movements? Here, however, we find ourselves in the field of physiological controversy; as far as regards the question first considered, it is a matter of little moment how the controversy may be decided. It may be remarked, however, that tetanus induced by strychnine, cannot be attributed to a general increased excitement of the nervous system. Were this the case, stronger contractions of the muscles dependent on the anterior cord laid bare in Exp. VIII., IX. and X., should have occurred rather before the administration of the poison than after it; but this was not the case. Other experiments, which require to be repeated, however, seem to show that the cause of reflex motion is to be sought for in the gray matter of the spinal cord; that the strychnine acts, therefore, by exciting to activity this gray matter, or rather the ganglionic in masses composed of it. These experiments are the following:—

Exp. XIV. A needle was carefully passed down through the centre of the spinal marrow, of a beheaded frog, as far as the point where the nerves to the anterior extremities are given off, and then withdrawn. Strychnine was then administered. Tetanus occurred in the posterior extremities only.

Exp. XV. After laying open the spinal canal, the gray matter of the posterior half of the cord was destroyed as far as it gave off nerves to the posterior extremities. The movements of the latter were little affected by the operation; but tetanus did not ensue after the exhibition of strychnine.—*Month. Journ. Med. Sci.*, Aug., 1847., from *Zeitschrift für Rationnelle Med.*, Bd. V. ht. 2.

3. *On the Nerves of the Sheaths of the Roots of Spinal Nerves.*—M. Pappenheim addressed a note to the Academy of Sciences, which was read at their sitting on the 13th of August, respecting the sheaths of the roots of spinal nerves, and the necessity of taking into consideration the existence of their small nerves in drawing conclusions from any experiments on recurrent sensibility. The author stated that he had rendered himself certain of the existence, both in the horse and dog, of small nerves on the sheaths of the anterior roots of the spinal nerves, a matter which had been doubted by some anatomists. From numberless observations on all parts of the human body, he had become persuaded that nerves would be found wherever arteries were met with. "Now, on the anterior roots of a spinal nerve, an artery is found; at its side are nerves, but their number, structure, origin, and situation, are not always the same. I find, too, as does M. Magendie, that the inferior nerves, on the anterior roots of which sensibility has so clearly been observed, have the greatest number of nerve-fibres in their sheaths, whilst the superior roots, of short extent, are so poorly provided with nerves, that sometimes I have failed to find any, but which at present appears a matter of little moment.

The nerves of the sheaths do not wholly belong to the system of vegetable life, (the organic nervous system,) but also, in part, to the cerebro-spinal system. The fact is completely beyond dispute, for I have two or three times succeeded in following nerves clearly arising from the root, and curving upwards, to arrive at the sheath of the motor nerves. Sometimes the nerves, having gained the sheath, proceed upwards; sometimes they descend; sometimes they may be followed to the inside of the dura mater; at other times they remain outside of it. In most cases I have succeeded in finding but one ramification of the nerves; once I have seen a nerve-filament, consisting of nearly eight or ten primitive fibres, mount and divide into two portions, one of which continued its course, whilst the other descended towards the periphery, forming an arch, such as is observed to be the termination of nerves, in numerous cases."—*Prov. Med. and Surg. Journ.*, Nov. 17.

4. *On the Pitch (Timbre) of the Human Voice.*—M. Segond communicated to the French Academy of Sciences a memoir on the modifications of the pitch of the human voice. The following are the conclusions at which he arrived:—

1. The timbre is not, like the tone and intensity, a simple quality of sound, but depends always on several circumstances collectively.

2. In the vocal apparatus the modifications of the pitch result from the general state of the system, and from the action of all the parts of the vocal apparatus; but it is particularly in the vocal tube that the cause of the modifications is to be found.

3. The pharynx, the mouth, and the nasal cavities, by acting more or less apart, or by combining in action, give to a sound very various timbres. If the vocal tube has a large dimension, the sound augments in volume, and becomes grave or dull. The pitch is, on the contrary, so much the clearer or shrill, as the dimensions of the tube are smaller.

4. The clear and the deep timbre have different degrees: their production does not result from a particular form of the tube. The fixity of the larynx, generally given as characteristic of a deep note, may, to an equal degree, belong also to the clear timbre; for if one executes a roulade or shake in a low note, the larynx offers in every respect its usual mobility.

5. The timbre of the improperly called guttural note is produced whenever the glottis vibrates with a very short tube.

6. The vowels, which may be considered as so many timbres, correspond to the form and dimensions of the buccal cavity.

7. When a sound traverses the nasal cavities, it may present three principal varieties. In the first case, the mouth being shut, if the sound is driven through the nasal cavities, the latter give passage to it without being able to arrest or to retain it, and the timbre is but slightly nasal. In the second case, if the sound pursue its course through the mouth, whilst the external orifice of the nasal fossæ is closed, the timbre becomes extremely nasal if the sound be directed into the cavity of the nose, for then it is retained at every part. In the third case, if the sound be directed into the same cavity whilst the mouth and nose are both open, it will at once escape from the two; but the sound will ring in the posterior part of the nasal fossæ. In this last case, the timbre will be less nasal than in the preceding, but much more so than in the first. One sees from this, that we must carefully distinguish the sound which escapes through these cavities, and that which rings in them. It is in this distinction that we find an explanation of all the phenomena of the nasal voice.—*Lancet*, Sept. 11, 1847.

5. *Intermittent Pulse coincident with Health.*—M. Bidard, d'Arras, gives an account of a man, above the middle stature, of the sanguine temperament, and of a strong constitution, and who had never suffered from any illness, except from inflammatory fever when about twelve years old, but the pulsation of whose heart and arteries were very abnormal. In 1826, M. Bidard was called to him on account of a contused wound of the left leg, from a kick of a horse, but which affected him very little. On that occasion, M. Bidard felt his pulse, when he noticed that after every two pulsations there was an interval of repose for nearly the length of one pulsation. There were forty-two pulsations and twenty-one periods of repose in a minute. The same condition was observed also in other arteries besides the radial. Upon listening to the heart's sounds, there were two normal and successive con-

tractions, and then an interval of rest, perfectly isochronous with that remarked in the pulse. On further auscultation and percussion, nothing otherwise abnormal could be detected about the heart and vessels, nothing at all to explain the intermittence. The man stated that this peculiar condition of his pulse was also remarked by the medical man who attended him in his only illness when a boy. From that time up to the period of his decease, lately—*i. e.*, for twenty years—M. Bidard has frequently marked the constancy of this anomalous circulation, as also have many other physicians. Death followed at the age of eighty-four, apparently as a consequence of old age, without any well characterized malady, but with a gradual failing of sight, hearing, and of the vital powers generally, and with the supervention of extreme anorexia.

After death, the lungs were found healthy, with a few pleural adhesions; the pericardium contained but little serum; the ascending and descending aorta, and the venæ cavæ, preserved their integrity; the heart was of a proportionate volume with the other viscera, and without any apparent anatomical lesion; the vessels were normal in their distribution; so also were the nerves.—*Prov. Med. and Surg. Journ.*, from *Gaz. Méd.*, Sept. 4.

[Similar cases are not uncommon. We have seen one case in which the pulse is always intermittent, except under the excitement of febrile action.]

—

6. *Vulvo-Vaginal Gland.*—M. Huguier has given a description of a gland situated at each side of the junction of the vulva to the vagina. It was discovered by Gaspard Bartholin, and was generally described by older anatomists; but of late its existence has been almost forgotten. According to M. Huguier, this gland is about the size and form of an apricot kernel, and is provided with an excretory duct, about seven or eight lines in length, the external aperture of which is situated in the angle between the vulva and the border of the hymen. This gland is small until puberty, when it is developed with the other organs of generation; it becomes turgid during sexual excitement, and secretes a quantity of clear mucus-looking fluid, which it is said to ejaculate with some force. M. Huguier agrees with former anatomists in regarding this gland as closely analogous to Cowper's gland in the male subject; for it is situated in about the same part of the perineum as this latter is, and presents the same anatomical relations and connections. It is an appendage to the vulvo-vaginal cavity, a part which is analogous to the urethra in the male; it receives the materials for its nutrition, and its sensation from the same vascular and nervous sources as does Cowper's gland; it presents also many varieties in form, size, and situation, and it may be absent on one or both sides, as is often the case with Cowper's gland.—*Monthly Journ. Med. Sci.*, Oct. 1847, from *Archives d'Anatomie.*

—

7. *Variations in the Quantity of Fat in the Human Lungs.*—M. Natalis Gaillot, having examined the chemical composition of the lungs under various circumstances, especially of disease, finds, among other points, that the pulmonary tissue of the fœtus contains a much larger quantity of fatty matter before than after birth: the amount begins to diminish with the first commencement of respiration. At the end of intra-uterine life, and just before the respiratory functions commence, the quantity of fatty matter in the tissues of dried lung may amount to 10, 12, 15, or 18 parts in 100: but when respiration has commenced, the proportionate quantity rapidly falls, and seldom exceeds 6 per cent. He finds, also, that in all affections of the chest, the consequence of which is a temporary or permanent obstruction to the respiratory functions over a greater or less extent of the pulmonary surface, the proportion of fatty matters increases in those parts which have become impermeable to air. The quantity of fatty matter may, in such cases, amount to 15, 20, 30, 40, or even 50 parts, in 100; while the healthy portions of the same organs usually do not contain more than about 10 per cent. This is observed at all periods of life, from the earlest infancy to extreme old age.—*Lond. Med. Gaz.*, Oct. 1847, from *Comptes Rendus*, July 12th, 1847.

—

8. *Congenital Deficiency of the Gall-Bladder.*—An example of this malformation is recorded by Mr. E. Canton, Demonstrator of Anatomy, in the *Lancet*, Oct. 16. He met with it in examining the abdomen of a female, aged sixty-five, who had

died in St. Martin's Workhouse, from disease of the brain. Mr. C. noticed that the portions of the intestine usually stained by bile, in its transudation, were untinged by that fluid; and on subsequently raising the liver, found the circumstance accounted for, by an absence of the gall-bladder from its usual situation; a shallow groove for it, however, was present, lined by peritoneum.

Suspecting malposition, Mr. C. searched for this viscus, or its remains, in the neighbourhood, but without success; and on subsequently making thin slices of the liver in its whole extent, was convinced that the case was one of congenital deficiency of the gall-bladder.

The liver was only two-thirds of its natural size, and healthy in structure. Nothing abnormal was seen in the other viscera. The right and left hepatic ducts were of their wonted length and ordinary diameter, uniting together at an obtuse angle just below the transverse fissure, to form a ductus choledochus, which was thus, by inclusion of the common hepatic duct, a longer canal than usual, whose relations were natural, but it was possessed of a calibre nearly twice as large as under ordinary circumstances. The lining membrane of this trunk presented the appearance characteristic of the mucous wall of the gall-bladder. The cystic artery, vein and nerves were wanting.

In the case related, Mr. C. remarks, the ductus choledochus must have formed the reservoir for the bile which is being continually secreted; and the small size of the liver would show, perhaps, that there was no greater amount of this fluid eliminated than the canal would conveniently contain. An interesting point is, a consideration of the mode in which the duct was induced, as it were, or forced, to part with its contents. When the gall-bladder is present, it is ordinarily believed that the abdominal muscles, in their contraction, so press upon it as to evacuate the bile, and that the expulsion is aided by the distension of the stomach and duodenum. In the present instance, of course, such offices were uncalled for, the bile having simply to be discharged from the ducts, which would be accomplished by the presence of chyme, in the duodenum, inciting their muscular coat to peristaltic action, at the same time that the orifice of the canal would be rendered patulous by the coincident movements of the gut.

ORGANIC CHEMISTRY.

9. *On the frequent occurrence of Alkaline Urine in Health, and the Errors of Diagnosis occasioned by a want of knowledge of this fact.* By Dr. Adolph Krukenberg of Brunswick.—The fact—first promulgated by Wöhler—that the internal use of salts of vegetable acids, and fruits containing them, causes the urine to be secreted alkaline, has been too much neglected by succeeding physiologists and pathologists. Our author found that a much smaller quantity of fruit was necessary for the production of this phenomenon than has hitherto been supposed, viz.—2 to 4 oz. of apple pulp, or 18 plums, weighing without the stones scarcely 1½ oz., sufficed to make the urine alkaline and hazy from phosphates; or if clear on excretion, heat caused their deposition; the addition of a little hydrochloric acid caused an effervescence like champagne; too much liquid, a bladder already filled with acid urine, or a disproportionate allowance of flesh, interfered with the success of the experiment. How often are those ill of chronic complaints who use a moderate diet, and with whom fruit is a useful and favourite article, troubled with hazy and alkaline urine, causing anxiety alike to themselves and their physician, which a little physiology does away with. In the simple chronic nephritis of Rayer, the chief symptom is the alkalinity of the urine; in no case was there a sectio-cadaveris; and some of the cases recovered so quickly, as to justify a doubt as to the correctness of the diagnosis; although he inculcates careful dietetic treatment, it is evident from his work that the semiotic influence of fruit in small quantities was unknown to him. This article is not forbidden at La Charité, and friends of the patients often carry them some. In several of his cases the alkalinity of the urine seemed to depend on purulent admixture, and consequent rapid putrefaction; and in one it seemed to be kept up, if not produced, by the use of an alkaline saline water (Contrexeville). The alkalinity of the urine has also been used

by Prout as a diagnostic sign of certain spinal affections. These he divides into two great classes.—1st. Those arising from depressing emotions and weakening influences; and in these he recommends the use of fruit, and fluids containing malic acid, as cider and perry: to these, and not to any disease, our author refers the alkalinity of the urine. 2d. Injuries of the spine; our author states, that neither Rayer nor himself had ever been able to observe the urine alkaline in cases of injuries of the spine, unless there were some existing or consecutive affection of the mucous membrane of the urinary passages, producing purulent admixture, hastening thereby the putrefactive changes in the urine. In the three cases detailed by Prout, two had stricture of the urethra, and the third retraction of the testicle, and a mucous sediment—all bespeaking the existence of some such affection. A microscopical examination, by showing the existence or absence of pus cells in the urine, would have confirmed the diagnosis, or at once corrected it. How far inattention to diet may have led to error, cannot be specified. Prout also mentions, without explanation, what has been already referred to—viz., that although alkaline urine, by copious secretion, be clear and bright, yet boiling causes it to deposit a phosphatic sediment, which falls without any such previous process, if the secretion be more sparing; the phosphates separate before the boiling point, and from their great specific gravity fall rapidly, and may thereby, as well as by their solubility in acids, be distinguished from the albumen found in Bright's disease.—*Month. Journ. Med. Sci.*, Aug., 1847, from *Zeitschrift für Rationelle Medizin*, Bd. III. ht. 1.

—

10. *Oxalic Diathesis.*—The *Provincial Med. and Surg. Journ.* contains a series of articles by Dr. Edward Ballard, illustrative of the condition of the system, which is accompanied by oxalic urine. The morbid states which Dr. B. has seen the oxalic diathesis accompany, are the following:—"Hypochondriasis; delirium tremens; a disposition to this disease or mental derangement from intemperance; mania; melancholia; mercurial tremor; cerebral hemorrhage; hysteria; spermatorrhœa; debility and cachexia connected with a scrofulous constitution; eczema; acne; gastrodynia; acute, gonorrhœal and chronic rheumatism; Bright's disease of the kidney, (shortly before the comatose stage;) cancer of the liver; cancer of the lung; cancer of the uterus and bladder; irritability of the bladder; enlarged prostate; hypertrophy, with valvular disease of the heart; and aneurism of the aorta. Its occurrence with granular kidneys and albuminuria is remarkable for its extreme rarity. In some persons of unhealthy parentage and scrofulous taint, I am disposed to believe, that the secretion of oxalate of lime with the urine may become habitual, since I have noticed it continue in such a person for some months, independently of the presence of any active disease, and unaffected by change of air, modifications of diet, or tonic medicine. So far as my own observations have been carried, the sexes appear to share equally in the diathesis."

In one case, (a girl, aged ten years, labouring under debility, connected with scrofulous constitution,) Dr. B. observed all three forms of oxalate of lime, the octahedral, dumb-bell and circular. The octahedra occur much more frequently than the other two forms. Out of 139 specimens of oxalic urine, examined by Dr. B., this form was present in 136, the dumb-bells 6, the circular 10. Out of 19 individuals, whose cases Dr. B. has analyzed, the octahedra occurred in 18, the dumb-bells 2, and the circular form 6. "In one individual I have seen," says Dr. B., "the circular plates are the only manifestation of the oxalic tendency, during the time he was under observation; but dumb-bells have, in my experience, never presented themselves without being accompanied, preceded, or followed by octahedra. The circular form, again, I have noticed to occur alone in three out of the ten examples of it; and in only one of the remaining seven were dumb-bells conjoined; and, although I am satisfied, from unrecorded observation, that dumb-bells also may occur without octahedra, yet, in the six specimens, alluded to above, they were accompanied by them. These two remarkable forms appear to be not very distantly allied. The specific gravity of the greatest number of specimens I have examined, ranged between 1014 and 1031, the average between these numbers being 1022. Out of 127 specimens, 14 were below specific gravity 1014, and 8 only above 1031. I have also remarked, with other observers, that when oxalate of lime was in progress of being discharged, a diminution of it

commonly took place whenever the specific gravity was remarkably lowered. One word more upon this head: the circular form appears connected with a specific gravity rather lower than the average. In the three instances, where it occurred alone, the specific gravity was 1011, 1015, and 1019; when with octahedra, 1010, 1016, 1020, 1021, 1022, 1023; but when with dumb-bells also, 1026. I have met with dumb-bells in urine as low as specific gravity, 1012, and as high as 1035. It has been stated that the appearance of uric acid not uncommonly precedes the disappearance of the oxalates. It occurred in seven out of the nineteen individuals mentioned, but in none could I perceive any relation of the kind. The sudden discharge of a large quantity of lithate of ammonia, however, has appeared occasionally to influence, in a temporary manner, the subsequent amount of oxalates."

—

11. *Composition of the Blood in New-Born Animals.*—M. Poggiale, from some experiments made by him, has arrived at the following conclusions, respecting the composition of the blood in new-born-animals, a subject on which there is much diversity of opinion among chemists:—

1. The proportion of water in the blood is rather high, whilst that of fixed matters is very considerable.

2. The blood of new-born animals is very rich in globules, and poor in fibrine.

3. The quantity of albumen, and of fatty matter, seems to be about the same as that found in the adult.

4. The oxide of iron is more abundant in the blood of the newly-born.

Of all the animals, whose blood he submitted to examination, that of young dogs alone presented a considerable proportion of globules. Among them, the mean proportion was 162.30. Among other young animals, he found less fixed matters and globules than in the adult state; however, the number indicating the proportion of globules is always relatively higher; that of fibrine is very low.—*Lancet*, Sept. 11, 1847.

—

12. *On the Condition of the Urine in a Case of Urticaria.* By Dr. Douglas Maclagan.—The gentleman whose case was submitted to the Society was a patient of Dr. Scott, and had long been the subject of severe attacks of urticaria, occurring almost daily, and after every meal, attacking particularly the face and upper part of the body, and by the disfigurement which they occasioned, as well as by the cutaneous irritation, proving a very distressing and annoying complaint. From inquiries made by his medical attendant, his attention was called to the state of his urine, respecting which he had not previously made any particular observations. When his attention was directed to this subject, he found that, though not in any way unnatural in quantity, it had a very pale colour, and considering it to be defective in some respect, he sent it to Dr. Scott for examination. Dr. Scott found it to be of remarkably low density, averaging only about 1010. Naturally suspecting that this might be connected with diseased kidneys, Dr. S. tested it for albumen, but not a trace of this substance could be detected in it. Under these circumstances, Dr. Scott submitted it to Dr. M. for more rigid examination, on the 26th December last.

The urine sent was the morning urine, which should always be used for examination where the whole urine of 24 hours cannot be obtained. The quantity sent was about 10 oz. It was of a very pale straw colour, quite transparent, and let fall no deposit on standing. Its reaction with litmus was feebly but distinctly acid. Its density 1009.039. It was analyzed by the process employed by M. Becquerel, in his *Semeiotique des Urines*, by which the amount of water, urea, uric acid, inorganic salts, are determined. The results obtained from the urine in the present instance were the following:—

Urea, ...	6·91
Uric acid, ...	0·05
Inorganic salts, . . .	12·03
Other organic matters and water, .	981·01
	1000·00

Albumen was carefully tested for by all the re-agents applicable to this end, and Dr. Scott's observation, that no trace of this substance was detectable, was fully confirmed.

The peculiarities of this urine will best be appreciated by contrasting it with the proportion given by Becquerel as the mean of the urine of healthy males. According to him, that is,

Urea, ...	13·838
Uric acid, ...	0·391
Inorganic salts, . . .	7·695
Other organic matters and water, .	978·076
	1000·000

It appeared, then, from this analysis, that the chief peculiarity in the present case was a deficiency in the ordinary characteristic ingredients of the urine, the urea, and uric acid. This could not arise from mere excess of water; first, because the urine was not excessive in quantity; second, because the inorganic salts were above the normal standard, whereas, had the water merely been in excess, they, too, ought to have indicated a diluted condition of the urine. Dr. M. ventured, therefore, to propose, as the pathological view of the case, that the defect here was merely a deficiency of the urea and uric acid; in short, a want of what modern chemists call the products of transformation of the tissues, and that the retention in this way in the system, of matters which ought to be eliminated from it, might be the cause of this cutaneous irritation, especially occurring, as it did, after meals.

The question now was, how was this to be remedied. It occurred to Dr. Maclagan that as it was known that colchicum had the property of increasing, in a remarkable degree, the amount of urea in the urine* of persons using it, this drug might have some effect in bringing the urine of this patient to a more healthy condition.

In conformity with this suggestion, Dr. Scott placed his patient on the use of the tincture of the seeds of colchicum, and, on the 13th January, when the colchicum had been in use for about a fortnight, another sample of the urine was procured, and analyzed, as before. The following were the results:—

Its density was 1029·9.

Urea, ...	20·36
Uric acid, ...	0·50
Inorganic salts, . . .	12·72
Other organic matters and water, .	966·42
	1000·00

Here, then, it will be seen that the expected physiological action of the colchicum was manifested in a marked degree. The urea was tripled in its amount, and raised above the normal standard. The increase of uric acid was in a tenfold ratio, whilst the water and the other organic constituents suffered, of course, a corresponding diminution, the inorganic salts remaining nearly as before.

The result of the case was more decidedly favourable than was anticipated. The tendency to the urticaria diminished, and at last entirely went off under the use of the colchicum, and the patient has kept free of his complaint since that time.

The above case was not adduced with the view to establish a pathological theory of urticaria. No single case will serve as a basis on which to found this. It was, however, laid before the Society, in order that attention may be directed towards the state of the urine in cases of a similar nature, and because it appears to be of some interest to observe a therapeutical result obtained from a consideration of the physiological action of a drug.

Allusion was made to the fact, that Dr. Elliotson, and others, had obtained good

* Dr. Christison's Observations on this point. Published by Dr. Robert Lewins, in his paper on Colchicum.—*Edin. Med. and Surg. Journal*, No. 148.

results from the use of colchicum in these diseases—*Proceedings of Med. Chirurg. Soc. Edinburgh*, in *Monthly Journ. Med. Sci.*, Aug. 1846.

13. *Nature of the Fæcal Evacuations in Cholera.* By M. Andral.—Among the alterations found in the solids and fluids of the body in patients affected with cholera, there is one which belongs especially to this disease, and which is characteristic of it: namely, the existence within the intestinal canal of a peculiar white fluid, very similar to water in which rice has been boiled. This material, which is sometimes found in large quantities in the intestines of persons who have died of cholera, and which constitutes the alvine evacuations during life, consists of a muddy liquid, capable of being rendered transparent by filtration, and within which are suspended, in greater or less abundance, lumps of opaque white matter, perfectly untinged by bile. Concerning the nature of this peculiar fluid, it has been considered to consist of the serum and fibrine of blood escaped from its vessels, and poured into the intestinal canal. The liquid portion of this material has been regarded as the serum of the blood; the solid grumous portion, as the fibrine. According to this view an explanation is afforded of the peculiar characters presented by the blood in cholera. And it is considered by many, that the blood, thus deprived of much of its serum, and of its globules, can no longer traverse with readiness the different capillary net-works of the body, and that thus many of the peculiar symptoms presented by this disease may be explained. The facts, however, on which such an opinion was founded, not having been sufficiently proved, M. Andral was induced, by the occurrence of several cases of cholera, in the hospitals of Paris, in 1846, to submit to careful examination the matters passed from the intestines. After having filtered this intestinal matter, and thus separated it into two portions, the one, liquid, perfectly transparent and colourless; the other, solid, consisting of a number of particles agglomerated together, he treated the liquid portion with alcohol, nitric acid, and heat; but by none of these reagents was a precipitate formed; consequently there was no albumen. The results of an examination of this liquid portion by M. Favre also showed that the organic substance contained in it, possessed none of the characters of albumen. This proves, therefore, that the serum of the blood does not enter into the composition of the materials ejected from the intestines in cholera. Like the serum, indeed, this fluid was highly alkaline; but this is a character common also to many other fluids of the economy. The contents of the intestines also are usually alkaline, and the alkalinity is not more marked in cholera than in many other diseases.

Moreover, if the intestinal secretion in cholera is essentially composed of albumen, the quantity of this material in the blood ought to be found considerably diminished, as it is in certain affections of the kidney attended with the transmission of albumen through these organs. The diminution, indeed, in cholera ought to be much greater than in such renal affections, because the quantity of secretion poured from the intestines is very large. But M. Andral, having examined the blood in all stages of cholera, finds that the proportion of albumen is almost unaltered, neither manifest increase nor diminution being found. He has obtained equally decisive proof also of the non-existence of fibrine in the intestinal secretions in this disease. No trace of a filamentous texture could be detected by the microscope in the solid masses evacuated. These solid masses he finds to be composed of numerous nucleated and nucleolated cells, closely resembling pus-globules. Besides these globules, which were very abundant, the masses contained also numerous particles of epithelium. It would appear, therefore, from the results of his examinations, that the white matter discharged from the intestines, in cholera, consists essentially of a mucous secretion in enormous quantity, and so far altered in quality as to contain an abundance of corpuscles in all respects similar to pus-globules, and to which the white appearance of the secretion is due.—*Lond. Med. Gaz.*, Oct. 1847, from *Comptes Rendus*, 9th Aug., 1847.

[Dr. J. Hughes Bennett very justly remarks, in commenting on these investigations of M. Andral—"We doubt very much the propriety of attaching the idea of fibrine only to that condition of the liquor sanguinis when it coagulates into filaments. This, in the adult, takes place, for the most part, only on serous, and is exceedingly rare on mucous membranes. In the latter situation, it is rapidly

transformed into pus, and should the observation of M. Andral be confirmed, we must accept it as an evidence of intense inflammation of the intestines in these cases.—*Month. Journ. Med. Sci.*, Dec., 1847.]

14. *Analysis of the Blood of Five Patients affected with Scurvy.* (*Archives Générales*, July, 1847.)—MM. Becquerel and Rodier, in a note presented to the Academy of Sciences, on the 21st of June last, give the following analysis of the blood of five patients, labouring under Scorbutus, under the care of M. Fauvel, at la Salpétrière.

Case I.—Female, aged 76. Severe case; first bleeding, the clot much buffed; second bleeding, fifteen days later, clot dense, resisting, dark-red, and spotted white striæ. Density when defibrinized, 1050.6. Density of serum, 1025.5.

Analysis of 1000 parts of Blood.		Analysis of 1000 parts of Serum.	
Globules	109.	Organic matters	77.7
Fibrin	4.1	Inorganic matters	7.8
Organic matters of serum	69.2	Water	914.5
Inorganic matters of serum	6.8		1000.
Water	810.9		
	1000.		

Case II.—Female, aged 74. Severe case; blood firmly coagulated. Density of defibrinized blood, 1048.6.

Analysis of 1000 parts of Blood.		Analysis of 1000 parts of Serum.	
Globules	110.8	Organic matters	73.8
Fibrin	3.6	Inorganic matters	7.
Organic matters of serum	65.7	Water	919.2
Inorganic matters of serum	6.2		1000.
Water	813.7		
	1000.		

Case III.—Female, aged 73. Slight case; clot dark and loose. Density of defibrinized blood, 1051.7. Density of serum, 1025.2

Analysis of 1000 parts of Blood.		Analysis of 1000 parts of Serum.	
Globules	116.5	Organic matters	76.2
Fibrin	3.	Inorganic matters	6.2
Organic matters of serum	67.3	Water	916.6
Inorganic matters of serum	5.5		1000.
Water	807.7		
	1000.		

Case IV.—Female, 69; mild. Density of defibrinized blood, 1047.2. Density of serum, 1023.8.

Analysis of 1000 parts of Blood.		Analysis of 1000 parts of Serum.	
Globules	116.	Organic matters	71.3
Fibrin	2.6	Inorganic matters	8.2
Organic matters of serum	63.1	Water	920.5
Inorganic matters of serum	7.3		1000.
Water	811.		
	1000.		

Case V.—Female, 72 years. Severe case; epistaxis. Density of defibrinized blood, 1038.3. Density of serum, 1020.8.

Analysis of 1000 parts of Blood.		Analysis of 1000 parts of Serum.	
Globules	79.4	Organic matters	61.5
Fibrin	2.2	Inorganic matters	8.5
Organic matters of serum	56.2	Water	930.
Inorganic matters of serum	7.8		1000.
Water	854.4		
	1000.		

From the study of the chemical and physical properties of the blood in these five cases, it appears—

1. That far from presenting that state of dissolution which has generally been admitted, the blood, in scurvy, coagulates firmly, and the serum is uncoloured by globules.

2. That the density of the defibrinized blood was in all the cases below the normal standard, (1057.)

3. That the density of the serum is notably diminished, (1027.)

4. That the globules were in all cases below the mean, (127.)

5. That the fibrin was in no case diminished, but in some sensibly increased.

6. That there was a notable diminution of organic matters of the serum, of which albumen constitutes the principal part, whilst there was a considerable proportion of water.

7. That in no case was there an augmentation of the saline matters, or of alkaline substances.

[The above memoir concludes with some observations on the complete subversion which the predominant theories of scurvy have received by these researches. It was thought the fibrin was diminished, and hence the profuse hemorrhages, &c. It is proved by these analyses, as was previously ascertained by Mr. Busk, that it is, on the contrary, in excess. The theory of the alkalinity of the blood is equally opposed by the above facts, as is also another favourite theory of M. Andral, that when the albumen is diminished to a certain point, dropsy is the necessary consequence, for it was found that though the number of albumen was low, anarsarca only appeared in one case, and that to a very trifling amount.]

MATERIA MEDICA AND PHARMACY.

15. *On Alkaline Medicines.* By M. Mialhe.—M. Trousseau has recently (see number of this Journal for July, 1846, p. 220), recalled attention to the fact that, when these are taken in too great a quantity, they increase the fluidity of the blood and deprive it of colour, and lead to cachexia, pallor, and general infiltration, passive hemorrhage, and an irreparable wasting—giving rise to far greater and more irremediable evils than the disease they are employed to combat, and causing just as much mischief as the abuse of iodine, mercury, or the preparations of iron. I propose here to indicate some of the circumstances under which alkalies may give rise to these ill consequences, and those of a contrary character, under which, perseveringly used, they may re-establish the deranged equilibrium of the economy.

First, we may observe that the administration of alkalies in excess does not give rise to so much mischief as does a similar abuse of acids. In the state of health the three principal fluids of the body, the chyle, the lymph, and the blood, are alkaline, and the amount of alkaline base they contain is incomparably greater than the amount of acids contained in other fluids. It is then in an alkaline medium that the animal organic mutations are operated, while in plants it is always in a neuter or acid medium that the phenomena of nutrition take place. The alkalies fulfil a far more important function in the economy than that of mere exciters and fluidifiers, presiding as they do over the decomposition and assimilation of hydro-carbonaceous substances of the amylaceous or cellular families.

But however the blood and other liquids may be physiologically a little more

or a little less alkaline, it does not follow that they may be inconsiderately administered. They stand at the head of the agents which exert on the serum the most marked fluidifying action. All the alkalies affect our economy in an identical manner. They produce on the organ of taste an impression *sui generis*, designated as *alkaline* or *urinary*. M. Chevreul showed this to be always due to the same substance, ammonia, which is set free by the decomposing effect exerted by the alkaline base on the hydrochlorate of ammonia contained in the buccal fluids. Experience has shown that, the same chemical fact prevails in respect to the bicarbonates and carbonates, and all the other fluids of the living body. Hence, wherever we introduce any alkaline substance into the economy, a certain quantity of ammonia is set free. This explains why the ingestion of a certain quantity of bi-carb. soda dissipates the symptoms of drunkenness—the ammonia disengaged restores to the albuminous elements of the blood that fluidity which the coagulating action of alcohol had partially deprived them of.

Under what circumstances is the employment of alkalies efficacious or dangerous? Clinical observation shows us that the daily taking of a drachm or a drachm and a half of bicarbonate of soda, or its equivalent of any other alkali, so far from being generally injurious, is frequently advantageous. Many persons can take far larger doses with impunity, while much smaller ones have, in some cases, induced serious accidents. All substances which produce an acid predominance in the blood allow of a large quantity of alkalies being taken. Thus, the inactive inhabitants of towns, in whom there is hardly any acid secretion from the skin, especially in winter, will bear large doses of alkalies. It is the same with those who live upon an almost exclusively meat diet, inasmuch as the albuminized elements containing sulphur and phosphorus, these two elements produce, by their interstitial combustion, phosphoric and sulphuric acids in marked proportions. This explains why the urine of the carnivora is normally acid, that of the herbivora always alkaline. On the other hand, whatever favours the predominance of alkalies in the vital humours forbids their employment. Thus the laborious inhabitants of the country, in consequence of their abundant acid sweats, can ill bear the ingestion of alkalies. So with persons who adopt an exclusively vegetable regimen, the blood is normally rich in carbonate of potass, by means of the transformation which the salts of potass in combination with the organic acids have undergone. Lastly, there are certain pathological conditions which lead us to vary the amount of alkalies given. Who does not know that in gout, gravel, and especially diabetes, immense quantities of these may be given? and who is not aware that certain summer and autumn putrid affections will not tolerate them?

Clinical observation has long shown that the various alkalies may replace each other in practice. This is the case with carbonate of lime and of magnesia: as also with the compounds of soda and potass. It has been erroneously stated that soda is more favourable to the animal constitution than potass. Analysis of the animal liquids shows that the potass compounds are equally prevalent with the soda, and as regards the herbivora, far more so. But, although we can in general, by the aid of any alkaline preparation, induce an identical medical result, we believe it is better to give the preference (as mere antacids) to those alkaline compounds which present the advantage of having always an uniform chemical composition, and of producing little or no therapeutical effect; and in these respects the hydrated calcined magnesia and the bicarbonate of soda seem to hold the first rank.—*Med. Chirurg. Rev.*, Oct. 1847, from *L'Union Médicale*, Nos. 1 and 4.

—

16. *On Alum Gargles.* By M. Mialhe.—We have shown elsewhere that the true *astringents* belong to the class of *coagulants*, that is to say, the class of chemical agents capable of entering into chemical combinations with the albuminous elements of the blood, and forming with them an insoluble compound. In applying this principle to *alum*, we showed how this substance, penetrating into our tissues, is first decomposed by the alkalies of the blood, so as to form an insoluble sub-salt, which is deposited in the organic tissues, filling their network, and, so to speak, tanning them. We pointed out how a new portion of alum, being no longer modified by the alkalies already saturated, then acts by fluidifying the albumen, in stimulating exhalation; and how, lastly, this *alum-albuminous fluid*, taken into the circulation, again becomes solid when it finds itself in presence of

all the alkalies contained in the mass of the blood—and in this way we explained the agency of large doses of alum in arresting hemorrhage. Thus, in a small quantity, it is a very precious local astringent; in a larger quantity it becomes an energetic local fluidifier; and, after absorption, a general hemostatic of undoubted efficacy.

We omitted to state why we thought this substance should not be combined with *mel rosæ*, which it so commonly is. It always contains a marked quantity of the proto-sulphate of iron by reaction, on which the tannin of the mel rosæ produces a greenish precipitate. This, besides being disagreeable in appearance, leads the patient to the belief that the properties of the medicine have become deteriorated. Preferable combinations are the following:—

1st. *Astringent Gargarism.*

Alum		½ a part.
Distilled water		150 parts.
Syrup of mulberries ——— Poppies	of each	25 parts.

For aphthous affections, mercurial stomatitis, and generally in all the diseases of the throat in which astringents are indicated.

2d. *Detersive Gargarism.*

Alum		20 parts.
Distilled water		100 parts.
Syrup of mulberries ——— Poppies	of each	30 parts.

In hoarseness, in aphonia, and in those affections of the pharynx characterized by great dryness, and in which it is desired to excite the excretion of the mucosities. It is in this same dose—that is, its fluidifying dose—that alum should be given for the prevention and cure of pharyngeal diphtheritis.

Most practitioners, I may remark, administer alum in too small a proportion for the removal of acute hoarseness, and especially in the aphonia of singers. Theory and practice alike show us that these cases require strong gargles.—*Ibid.*, No. 34.

—

17. *Astringent Collyria.* By M. Mialhe.—Many practitioners are in the habit of prescribing *mucilages* of gum, psyllium, and especially of quince, with the different medicinal agents which constitute the base of their astringent collyria. It is a bad practice, since all true astringents necessarily belong to the class of bodies which coagulate the serum of the blood, and all substances which coagulate albumen also coagulate gum and the liquids which contain it; whence it results that the addition of mucilage to a salt of alum, zinc, copper, lead silver, &c., necessarily gives rise to more or less of an entirely insoluble precipitate, which can in nowise advantageously act upon the mucous membrane of the eye. Such a combination is worthy of the period which gave rise to it. It belongs to that epoch in therapeutics in which practitioners were persuaded that all agents capable of modifying the living economy were endowed with absolute curative properties, having nothing in common with the action they exercised on our organs, an action which they considered as generally hurtful, and never useful. A fundamental error which time and experience have happily done justice to!—*Ibid.*, No. 40.

MEDICAL PATHOLOGY AND THERAPEUTICS AND PRACTICE OF MEDICINE.

18. *On the Phosphate of Ammonia, and its value in the Treatment of Gout and Rheumatism.*—This is the title of a paper, read by Dr. Samuel Edwards, to the Bath and Bristol Branch of the Provincial Medical Association, and published in the *Provincial Medical and Surgical Journal*, Nov. 17th, 1847. The author states that some years since he "was informed by an American friend," that he had seen phos-

phate of ammonia prescribed occasionally in gout and rheumatism, with unquestionably good results, and he therefore determined to put this medicine to the test of experience, which he has now done to a considerable extent, and with decided success. "*Since* employing the remedy," Dr. Edwards states, he finds "that Dr. Buckler, of Baltimore, has also employed this salt in these diseases, and with great success." This is doing our correspondent, Dr. T. H. Buckler, very scanty justice, for to him is undoubtedly due the credit of introducing this article into use, as a remedy for gout and rheumatism, and from his paper, published in this Journal, (Jan. 1846,) Dr. Edwards' American friend undoubtedly obtained the information he communicated.

Dr. Edwards states, that he has "now used this remedy, with great success, in almost every variety of gout and rheumatism. In acute articular rheumatism I have not exhibited it during its more inflammatory stage; but after this has been subdued somewhat by the usual antiphlogistic treatment, it very speedily relieves the pains, and in the majority of cases prevents fresh joints from being attacked. I cannot speak positively from sufficient data at present, but I am inclined to believe that the chronic form which is not unfrequently left behind from the acute, may often be obviated. I feel convinced I have prevented, by administering this salt prior to the coming on of the inflammatory symptoms, several times, attacks of gout and rheumatism, and this in individuals disposed to their invasion. In *chronic articular rheumatism*, I have used it after the bowels have been well cleansed by calomel or other purgatives, or if the constitution is vigorous, the vascular action strong, and heat high, after venesection, and I have got rid of these attacks much sooner than formerly. In muscular rheumatism, whether of the acute or chronic form, I have employed this remedy with greater success than in any other. After the action of the intestinal canal was somewhat regulated, I have generally been able, without further preface, to administer it in lumbago, pleurodynia, ischio-gluteal rheumatism, epicranial, (cephalodinia,) cervical, (auchenodynia,) and facial rheumatism. In these I have seen it of peculiar service, and in one case of rheumatic ophthalmia, after the inflammatory symptoms had been reduced, and the patient was annoyed with the pains about the eye and brow, in which I administered it, it was attended with alleviation and subsidence of the pains within sixteen hours of being commenced. I am not prepared to assert that this salt will prove of benefit in those cases of chronic rheumatism, where the disease has already affected the cellular tissue, bone, or cartilage, and occasioned such appearances of morbid anatomy as have been described by Hasse. It may relieve, but I cannot believe it possibly curative.

"With respect to gout, my opportunities of applying this remedy have been less numerous than in rheumatism, yet numerous enough to enable me to speak with certainty of its great value as a remedy; when given in the doses I have mentioned, it produces but little sensible operation beyond that most important of all, the gradual (in two or three cases I have seen it act almost instantaneously), diminution of the distressing symptoms. With this view I have always prefaced its use by well cleansing out the bowels with proper aperients, and then ordering the phosphate every eight hours in simple water, or occasionally in conjunction with a bitter infusion and spirits of nitre, the best infusion perhaps being that of the serpentaria, as it determines to the skin. Attention both before and during the administration of the phosphate to the due performance of the various functions connected with the primary assimilating processes, is of great moment. A slight alterative aperient of mercurial pill and compound rhubarb pill, given every other night, twice or thrice, has answered well. I have seldom meddled with the inflamed part beyond ordering perfect rest, and exciting perspiration by means of fleecy hosiery or flannel, covered over with oil-silk, occasionally a light anodyne poultice or narcotic fomentation, and of course a consistent diet, and abstinence from everything irritating both of body and mind, were points duly remembered. In the third case in which I employed the salt, it was strikingly beneficial. A poor man, a dispensary patient, a very gouty subject, had had an attack for two or three weeks, being confined wholly to his bed or arm-chair. He had tried, and I had previously used, most of the most renowned remedies, with little or no relief. On a Wednesday afternoon he commenced taking the phosphate of ammonia, (ten grains every eight hours,) and on the Friday morning following he attended me

at the dispensary, walking each way, and informed me he had lost all pain, and that the swelling and stiffness were rapidly subsiding. To use his own words, 'the second dose of this last mixture had acted like a charm.' On the Tuesday following he began his work again as a mason. I ordered his continuance for a short time of the salt, combining it with a bitter infusion, and the regular use of a mild aperient.

"This latter point of continuing the remedy a short time, I consider a matter of importance, paying at the same time particular attention to the condition of the digestive organs. With regard to the value of this salt as a solvent upon the gouty concretions when formed, my experience does not enable me to speak with any certainty, but my observations lead me to state in a positive manner its powers to arrest the increase, and I believe the formation of them. So great is the solvent action of the phosphate of ammonia, after being introduced into the system, upon uric acid, that I am almost inclined to think calculous disease of that nature may be very greatly benefited by its employment. It is worthy of consideration when we remember the frequent occurrence of uric acid calculi, and the fact that most others of different character have uric acid for their nucleus. In lithic acid gravel I have frequently used it, and experience has taught me that it causes a very rapid decrease and disappearance of the red crystalline sediment; it quickly reaches the urine, (as I have testified oftentimes upon my own person,) when largely diluted. Mr. Alexander Ure (*Med. Chir. Trans.*, vol. xxiv.) has recommended the benzoic acid for the same purpose. I have used it many times, but never with so marked a result as with the phosphate of ammonia. Dr. Garrod has stated, and his statement has been confirmed by Dr. Booth and Mr. Boyé, of Philadelphia, that uric acid is unaffected by the conversion of benzoic acid into hippuric acid, the urea alone being diminished."

These statements are entirely confirmatory of Dr. Buckler's experience, as detailed in his paper in this Journal.

—

19. *Croup cured by Cauterizing the Larynx with a Solution of the Nitrate of Silver.*—Dr. Latour was sent for to a child of four years old, ill of sore throat, accompanied with a hoarse cough, fever, anxiety, and other severe symptoms, the uvula and right tonsil being covered with very adherent false membranes. Nitrate of silver in the solid form was immediately applied to all the afflicted parts within reach, and a vomit was given, by which some fragments of false membrane were brought away. Next day the false membrane had not covered the left tonsil, but appeared to have extended downwards, and the larynx seemed to be involved in the disease, as there was a suppressed hissing cough, and a loss of voice. Objecting as insufficient to the usual method of applying the nitrate of silver in such cases, namely, by introducing into the back part of the throat a sponge dipped in the solution of the salt, Dr. L. determined to use a stronger solution, between seven and eight grains to the ounce (fifty centigrammes to thirty grammes of water), and to adopt a method of applying it which he had already published in the "Clinique des Hôpitaux des Enfants." This consists in saturating a strong ball of lint in the solution, and conveying it to the opening of the larynx by means of a long curved pair of forceps, and then squeezing out the solution by compressing the ball between the blades. In this manner the solution was applied in the case referred to every eight hours for four days with complete success; the voice was first restored, and then the convalescence soon became complete.—*Monthly Journ. Med. Sci.*, Oct. 1847, from *Gazette Médicale de Paris*, 21st August, 1847.

—

20. *On the Morbid Anatomy and Pathology of the Typhus Fever which has been prevalent in Edinburgh during the session* 1846–7. By Dr. Hughes Bennett.—Until the commencement of the present session, cases of intestinal lesion in typhus fever have been exceedingly rare. During the three years the author had acted as pathologist to the Royal Infirmary previous to the present session, and during which he had examined upwards of 500 individuals who had died of the disease, he had only met with it three times. Since November, however, they had become more frequent, and the author had studied the morbid anatomy of typhus in reference to the opinions set forth by Rokitanski, Engel, Hammernick, Gunsburgh, and other pathologists of the Vienna and Prague schools of Medicine. According to these observers, typhus fever is accompanied by a peculiar dyscrasia of the

phate of ammonia prescribed occasionally in gout and rheumatism, with unquestionably good results, and he therefore determined to put this medicine to the test of experience, which he has now done to a considerable extent, and with decided success. "*Since* employing the remedy," Dr. Edwards states, he finds "that Dr. Buckler, of Baltimore, has also employed this salt in these diseases, and with great success." This is doing our correspondent, Dr. T. H. Buckler, very scanty justice, for to him is undoubtedly due the credit of introducing this article into use, as a remedy for gout and rheumatism, and from his paper, published in this Journal, (Jan. 1846,) Dr. Edwards' American friend undoubtedly obtained the information he communicated.

Dr. Edwards states, that he has "now used this remedy, with great success, in almost every variety of gout and rheumatism. In acute articular rheumatism I have not exhibited it during its more inflammatory stage; but after this has been subdued somewhat by the usual antiphlogistic treatment, it very speedily relieves the pains, and in the majority of cases prevents fresh joints from being attacked. I cannot speak positively from sufficient data at present, but I am inclined to believe that the chronic form which is not unfrequently left behind from the acute, may often be obviated. I feel convinced I have prevented, by administering this salt prior to the coming on of the inflammatory symptoms, several times, attacks of gout and rheumatism, and this in individuals disposed to their invasion. In *chronic articular rheumatism*, I have used it after the bowels have been well cleansed by calomel or other purgatives, or if the constitution is vigorous, the vascular action strong, and heat high, after venesection, and I have got rid of these attacks much sooner than formerly. In muscular rheumatism, whether of the acute or chronic form, I have employed this remedy with greater success than in any other. After the action of the intestinal canal was somewhat regulated, I have generally been able, without further preface, to administer it in lumbago, pleurodynia, ischio-gluteal rheumatism, epicranial, (cephalodinia,) cervical, (auchenodynia,) and facial rheumatism. In these I have seen it of peculiar service, and in one case of rheumatic ophthalmia, after the inflammatory symptoms had been reduced, and the patient was annoyed with the pains about the eye and brow, in which I administered it, it was attended with alleviation and subsidence of the pains within sixteen hours of being commenced. I am not prepared to assert that this salt will prove of benefit in those cases of chronic rheumatism, where the disease has already affected the cellular tissue, bone, or cartilage, and occasioned such appearances of morbid anatomy as have been described by Hasse. It may relieve, but I cannot believe it possibly curative.

"With respect to gout, my opportunities of applying this remedy have been less numerous than in rheumatism, yet numerous enough to enable me to speak with certainty of its great value as a remedy; when given in the doses I have mentioned, it produces but little sensible operation beyond that most important of all, the gradual (in two or three cases I have seen it act almost instantaneously), diminution of the distressing symptoms. With this view I have always prefaced its use by well cleansing out the bowels with proper aperients, and then ordering the phosphate every eight hours in simple water, or occasionally in conjunction with a bitter infusion and spirits of nitre, the best infusion perhaps being that of the serpentaria, as it determines to the skin. Attention both before and during the administration of the phosphate to the due performance of the various functions connected with the primary assimilating processes, is of great moment. A slight alterative aperient of mercurial pill and compound rhubarb pill, given every other night, twice or thrice, has answered well. I have seldom meddled with the inflamed part beyond ordering perfect rest, and exciting perspiration by means of fleecy hosiery or flannel, covered over with oil-silk, occasionally a light anodyne poultice or narcotic fomentation, and of course a consistent diet, and abstinence from everything irritating both of body and mind, were points duly remembered. In the third case in which I employed the salt, it was strikingly beneficial. A poor man, a dispensary patient, a very gouty subject, had had an attack for two or three weeks, being confined wholly to his bed or arm-chair. He had tried, and I had previously used, most of the most renowned remedies, with little or no relief. On a Wednesday afternoon he commenced taking the phosphate of ammonia, (ten grains every eight hours,) and on the Friday morning following he attended me

at the dispensary, walking each way, and informed me he had lost all pain, and that the swelling and stiffness were rapidly subsiding. To use his own words, 'the second dose of this last mixture had acted like a charm.' On the Tuesday following he began his work again as a mason. I ordered his continuance for a short time of the salt, combining it with a bitter infusion, and the regular use of a mild aperient.

"This latter point of continuing the remedy a short time, I consider a matter of importance, paying at the same time particular attention to the condition of the digestive organs. With regard to the value of this salt as a solvent upon the gouty concretions when formed, my experience does not enable me to speak with any certainty, but my observations lead me to state in a positive manner its powers to arrest the increase, and I believe the formation of them. So great is the solvent action of the phosphate of ammonia, after being introduced into the system, upon uric acid, that I am almost inclined to think calculous disease of that nature may be very greatly benefited by its employment. It is worthy of consideration when we remember the frequent occurrence of uric acid calculi, and the fact that most others of different character have uric acid for their nucleus. In lithic acid gravel I have frequently used it, and experience has taught me that it causes a very rapid decrease and disappearance of the red crystalline sediment; it quickly reaches the urine, (as I have testified oftentimes upon my own person,) when largely diluted. Mr. Alexander Ure (*Med. Chir. Trans.*, vol. xxiv.) has recommended the benzoic acid for the same purpose. I have used it many times, but never with so marked a result as with the phosphate of ammonia. Dr. Garrod has stated, and his statement has been confirmed by Dr. Booth and Mr. Boyé, of Philadelphia, that uric acid is unaffected by the conversion of benzoic acid into hippuric acid, the urea alone being diminished."

These statements are entirely confirmatory of Dr. Buckler's experience, as detailed in his paper in this Journal.

—

19. *Croup cured by Cauterizing the Larynx with a Solution of the Nitrate of Silver.*—Dr. Latour was sent for to a child of four years old, ill of sore throat, accompanied with a hoarse cough, fever, anxiety, and other severe symptoms, the uvula and right tonsil being covered with very adherent false membranes. Nitrate of silver in the solid form was immediately applied to all the afflicted parts within reach, and a vomit was given, by which some fragments of false membrane were brought away. Next day the false membrane had not covered the left tonsil, but appeared to have extended downwards, and the larynx seemed to be involved in the disease, as there was a suppressed hissing cough, and a loss of voice. Objecting as insufficient to the usual method of applying the nitrate of silver in such cases, namely, by introducing into the back part of the throat a sponge dipped in the solution of the salt, Dr. L. determined to use a stronger solution, between seven and eight grains to the ounce (fifty centigrammes to thirty grammes of water), and to adopt a method of applying it which he had already published in the "Clinique des Hôpitaux des Enfants." This consists in saturating a strong ball of lint in the solution, and conveying it to the opening of the larynx by means of a long curved pair of forceps, and then squeezing out the solution by compressing the ball between the blades. In this manner the solution was applied in the case referred to every eight hours for four days with complete success; the voice was first restored, and then the convalescence soon became complete.—*Monthly Journ. Med. Sci.*, Oct. 1847, from *Gazette Médicale de Paris*, 21st August, 1847.

—

20. *On the Morbid Anatomy and Pathology of the Typhus Fever which has been prevalent in Edinburgh during the session* 1846–7. By Dr. Hughes Bennett.—Until the commencement of the present session, cases of intestinal lesion in typhus fever have been exceedingly rare. During the three years the author had acted as pathologist to the Royal Infirmary previous to the present session, and during which he had examined upwards of 500 individuals who had died of the disease, he had only met with it three times. Since November, however, they had become more frequent, and the author had studied the morbid anatomy of typhus in reference to the opinions set forth by Rokitanski, Engel, Hammernick, Gunsburgh, and other pathologists of the Vienna and Prague schools of Medicine. According to these observers, typhus fever is accompanied by a peculiar dyscrasia of the

blood, and the intestinal and other lesions produced, contain a peculiar deposit called typhous deposit, which bears the same relation to the constitution of the blood as tubercle and cancer do to the tubercular and cancerous cachexiæ.

The cases of fever admitted into the Royal Infirmary from the 1st of November, 1846, to the 30th of June, 1847, amounted to 2071. Of these 278 died. Owing to the imperfect arrangements which exist in the Royal Infirmary, however, regarding post-mortem examinations, only 63 of these cases had been inspected after death. It was upon these data that the following statements were founded.

The organ most frequently affected was the spleen. In the majority of cases it was more or less enlarged and softened, presenting a mahogany-brown colour and creamy consistence; so that when pressed, nearly the whole of its parenchyma could be squeezed out of its capsule. In ten cases the spleen contained one or more infiltrated masses of typhous deposit, of a yellowish or brownish-yellow colour. In two cases the deposit had softened and burst into the peritoneum, causing fatal peritonitis.

The organs most frequently affected after the spleen were the lungs. The most common lesion was bronchitis, the bronchial lining membrane being of a deep mahogany or purple colour, more or less infiltrated with serum or exudation. The fine bronchial tubes were frequently filled with a muco-purulent matter, more or less fluid, and in a few cases choked up with a reddish-brown creamy substance, probably a modified form of the exudation (typhous deposit) described by Remak. The apices of the lungs were very commonly œdematous, yielding on section a copious, grayish, frothy fluid. In fifteen cases the lungs were more or less consolidated by exudation, which seldom presented the characters of normal hepatization. It was sometimes of a dirty-yellow tint, at others of a brownish-chocolate colour, existing in masses of irregular outline, and of variable size, resembling the typhous deposit previously spoken of, occasionally found in the spleen. In three cases there was pulmonary apoplexy.

The intestines presented the lesion so well described by Bretonneau, Louis, Cruveilhier, and others (dothinenteritis, typhoid ulcer, &c. &c.), in 19 cases. The peculiar elevation, sloughing, and ulceration of the round and oval patches had been carefully observed, and the anatomical description given by Mr. Goodsir (*Monthly Journal*, p. 353, 1842) for the most part confirmed. The elevated patches had been observed occasionally to extend as high as the duodenum, and as low as the rectum. In one case numerous dothinenteric elevations, about the size and shape of a split plea, extended all over the ascending and transverse colon. In a few cases the isolated follicles, in the large intestines, were observed swollen and empty, presenting in their centre a dark-blue or black spot. In others, the round and oval patches of the small intestine were hypertrophied, elevated above the mucous membrane, and of a grayish or slate colour. Perforation of the intestine, causing fatal peritonitis, had occurred in three cases. Dysentery, with flakes of lymph attached to the mucous membrane, over the ascending and transverse colon, was associated with intense dothinenteritis in one case. Oval and round cicatrices, exhibiting different stages of the healing process of the intestinal typhous ulcer, were observed in two cases.

In all the cases where the intestinal ulcerations were recent, the mesenteric glands were enlarged, soft, friable, and of a grayish or reddish-purple colour. Some of these glands reached the size of a hen's egg. On section they presented a finely granular surface of a dirty yellow-grayish, or dark fawn colour, produced by infiltration of the typhous deposit, which was generally soft and friable, but sometimes in one or more parts of the swollen gland broken down with a fluid of creamy consistence.

In two cases there were glossitis and laryngitis, with tonsilitis; in one case abscess in the kidney, and in one an abscess in the posterior mediastinum.

The brain did not appear to participate much in the disease. It presented only occasional congestion, with slight effusion into the sub-arachnoid cavity, or into the lateral ventricles.

The blood in the great majority of cases was fluid, and of a dirty-brownish colour. In those instances, however, where the disease had been protracted, and especially in such as presented well marked typhous deposit, firm coagula were found in the heart and large vessels.

In seven cases no lesion whatever could be discovered.

The typhous deposit consists of a yellowish or flesh-coloured exudation, sometimes passing into a brownish colour, from the admixture of more or less blood. When first formed it is of tolerably firm consistence, as in the spleen and glands of the mesentery and intestines, but rapidly undergoes the process of softening. In parenchymatous organs it may be slowly absorbed or resolved, as in the lungs, spleen, and mesenteric glands, or it may produce ulceration or gangrene. In either case, should the individual recover, cicatrices with puckerings in the tissue are produced, the parenchyma around the deposit having contracted and become indurated. On mucous membranes the deposit is thrown off in the form of slough, and discharged by the excretory passages, leaving a characteristic round or oval-shaped ulcer. This process may be followed by cicatrization or perforation of the gut by ulceration. In the former case it leaves a round or oval-shaped depression in the mucous membrane, often of a blue colour, which subsequently becomes covered with epithelium: in the latter case it produces death by peritonitis.

The minute structure of the typhous deposit varies in different situations. In the lungs, spleen, and intestinal canal, it contains at an early stage a number of roundish or irregularly shaped corpuscles. They are about the $\frac{1}{1000}$ of a millimetre in diameter, contain several granules, with a nucleus about the $\frac{1}{3000}$ of a millimetre in diameter. Acetic acid renders them more transparent. They are conjoined with numerous granules and molecules, which become more abundant as the process of softening advances. In the mesenteric glands a higher degree of cell formation takes place. Cells are formed about the $\frac{1}{500}$ of a millimetre in diameter, containing from two to six, and sometimes even more nuclei, which become very distinct with thick edges on the addition of acetic acid, whilst the cell wall is partially dissolved. The same cells may occasionally be seen in the elevated typhous deposits of the intestinal glands. Sometimes the only appearance observable in the deposit, is that of numerous molecules, and granules mixed with blood corpuscles.

Dr. Bennett considered that the pathology of this affection consisted in a primary alteration of the blood, caused by the peculiar miasm or poison causing typhus fever; that, under such circumstances, local inflammations were set up in particular organs, and that the exudation attending it, instead of presenting the usual appearances, and undergoing the usual trsnsformations, became modified so as to constitute the typhous deposits.

Dr. Christison noticed, some time ago (Art. Fever, *Lib. of Medicine*), that the Edinburgh fever was especially characterized by pulmonary complications. We know that in France and Germany, intestinal lesions are most common. During the present session, however, the latter had also become frequent in Edinburgh, and it was a fact worthy of observation, that this change occurred at a time when scurvy, and bad diet prevailed, circumstances often known to be associated with this form of fever in France and Germany.*

Numerous preparations were shown to the Society, exhibiting typhous deposits in different organs.—*Proceedings of Med. Chirurg. Soc. of Edinburgh*, in *Monthly Journ. Med. Sci.*, Oct. 1847.

—

21. *On a New and Successful mode of Treating Fever.*—This is the title of a paper read by Dr. William Gill, before the Provincial Medical and Surgical Association, and published in the *Prov. Med. and Surg. Journ.* for 22d September last. The form of fever to which Dr. G. has applied the mode of treatment to be described, is that which has been so prevalent the past year in Great Britain. The plan of treatment is as follows:—

"On a flock bed I have placed from three to five blankets, superimposed over these a sheet wrung out of cold water, on which the patient, stripped, is placed, with legs outstretched, and arms to the side; the sheet is then drawn tightly around

* The Edinburgh fever epidemic of 1846-7, has found an excellent historian in Dr. Bennett's pathological assistant, Dr. Waters, whose Thesis on this subject was crowned with a gold medal at the graduation of the present year. We trust that the essay will shortly be published.—Ed.

up to the neck, and inclosing the feet; first, one blanket, then another, and so on to the whole number, are tightly drawn over the sheet, so as to have the *whole body well and closely packed.* In this state the patient lies from a quarter of an hour to one or two hours, according to the object in view, and the effect produced. Some get tired at the end of half an hour, some can continue for one or two hours, and feel very comfortable. As soon as a gentle perspiration commences, a wine-glass full of water is given frequently. At the commencement of this treatment, in a case of fever, I have generally ordered its use for one hour; after that time the wet things are removed, and the sick person is placed in bed, well wrapped in three blankets, and allowed to perspire for three hours; afterwards, the blankets are to be carefully removed, one at a time, so as to allow the perspiration to subside gradually, and the patient is then placed in bed between the sheets.

"During the whole of this period, small quantities of water should be given. In the summer, during this process, a free ventilation may be allowed in the chamber; in winter, it is necessary to have a good fire, and to have one blanket well warmed to apply around the body, so soon as removed from the wet sheet.

"Several cases of incipient fever have lost all traces of disease after the first application. If the fever is not reduced, the next day the same plan must be repeated, keeping the patient in the wetted sheet from half an hour to one hour, according to the intensity of the symptoms, and in the blankets from one to two hours. This may be repeated every day till indications of *a cool* skin arise; then it must be immediately discontinued.

"During some period of this treatment, the temperature of the atmosphere being very high, (75° to 78° in shade,) I have not found it advisable to keep the patient as long as two hours sweating in the blankets; from half an hour to one hour was sufficient. A longer period caused the pulse to be accelerated, instead of lowered, which latter is the usual effect of the treatment. In very hot weather, when a free perspiration has been induced at the commencement of the fever, I have adopted the following plan:—To wrap the sick person for half an hour in the wet sheet, covered lightly with one blanket; to be then washed all over with a towel wetted with tepid water, then rubbed dry, and placed in bed between the sheets. I have not found it necessary to make use of this treatment more than five times to the same individual; generally after the third or fourth application the skin becomes cooler, and the other signs of fever gradually subside. When the skin becomes cool, and the tongue less dry, I have instantly discontinued all water remedies, and given bark, wine, and broths, and it was surprising how soon convalescence and strength become established. During the whole course of the fever, milk and water, or weak broths, were allowed *ad libitum.* In one person, twice, in the course of the same day, owing to the intensity of the fever, it was found necessary to repeat the wet sheet, using it the second time for only half the period of the first; a comfortable night ensued.

"Without doubt this is a most effective mode of *quickly* reducing the temperature of the body; an equilibrium is soon established between the cold of the water and the heat of the body, and the patient becomes bathed in a natural vapour bath, as may be felt by placing the hand under the bed-clothes. Where the fever runs high, and the delirium is violent, the wet sheet may be safely applied for short periods, (two minutes,) several times in the course of the day. This will be found a more effectual mode of reducing the cerebral excitement, than any other means with which we are acquainted. This refrigerating plan, used for ten minutes, during an evening exacerbation, will often produce a few hours refreshing sleep.

"I must confess that I had great doubts as to the *safety* of this treatment, where the mucous membranes of the bronchi and gastro-alimentary passages were complicated. Very soon my fears on this head were dissipated by the convincing evidence of experience; in fact, *these* proved the cases in which the decided benefit of the treatment was most marked. The quick and embarrassed respiration, dry cough, and sonorous râles, subsided quickly after one or two applications of the wet sheet; the cough became looser, the râles moister, and expectoration was established.

"The same happy change also occurred where the gastro-alimentary membranes were disordered. Generally the first wet sheet puts a stop to the diarrhœa, and soon afterwards pain and swelling disappeared. A confined state of the

bowels was frequently the effect of the wet sheet, and it was found necessary in several of the patients to resort to small doses of castor oil. In three or four cases the symptoms of gastric and abdominal irritation or inflammation were so violent, as to have justified the employment of leeches, calomel, and opium; and indeed we know that depletion by leeches is the usual treatment followed in the Parisian hospitals, and yet by the simple means mentioned, in three days every bad symptom had vanished. A great saving is made to the patient's strength when we can dispense with the abstraction of blood."

Dr. G. has treated twenty-five cases by this method, but says, very justly, "that a more extended experience is required, before its merits can be fully determined."

From the facts he has observed, Dr. Gill draws the following conclusions.

"1. That the judicious use of the wet sheet has a powerful influence in relieving many of the most distressing symptoms of fever.

"2. That if applied *very early* in the disease, it may in some cases arrest its further progress.

"3. That if used *later* in the disease it has a controlling influence, bringing the fever to a termination much earlier than by any other known treatment.

"4. That the ordinary *complications* of fever are no arguments against, but rather for, its use.

"5. That with this treatment, weak broths and milk and water, *ad libitum*, may be allowed.

"6. That the first symptoms of the subsidence of the fever, were a cool and often moist condition of the skin, a diminution of thirst, and an improvement in the tongue. When these changes occur, the treatment must directly be discontinued, and bark and better diet be ordered.

"7. That some of the worst cases of typhus fever were convalescent, and walking about on the fifteenth day from the commencement of the attack."

—

22. *Contributions to the Pathological Anatomy of the Intestinal Mucous Membrane in the Infant at the Breast.* By Friedleben and Flesch, of Frankfort.—Hitherto softening of the mucous membrane of the stomach and enlargement of the mesenteric glands have been usually regarded as the only causes of the acute or chronic diarrhœa, with atrophy, to which so great a mortality is due within the first year of life. This view our authors think they can disprove by exact post-mortem investigations. Softening of the mucous membrane of the stomach they regard as exceedingly rare, having met with it only in two instances, in one of which it proved fatal within twenty-four hours, while, in the other, there existed a fatal complication of intestinal disease. Diminished consistence at the fundus of the stomach was more frequently observed, but its origin was at all times secondary. They found enlargement of the mesenteric glands also to be uniformly secondary, of limited extent, and rarely of distinct character, except in the glands on the root of the mesentery. The enlargement of these glands could not have been felt through the abdominal walls, and hence it seems certain that hardened feculent masses had been mistaken by many for enlarged glands. Our authors indeed affirm, that even in the dissecting-room, after opening the abdominal cavity, the mesenteric glands cannot be felt enlarged until the intestines have been removed.

Before entering on the pathological appearances, our authors give a sketch of the normal appearances of the parts concerned in infants at the breast. The colour of the mucous layer, as well as of the subjacent mucous membrane itself, is either grayish-white or yellow, from the colouring principle of the bile, or more or less of a darkish livid colour, from imbibition of blood. It is to be remarked, however, that in this last case the mucous membrane is free from any arborization or punctation. The mucous membrane adheres very closely to the subjacent tissue, so that, after being cut through, it can be detached only to a small extent. The mucous membrane of the colon, however, is less firmly adherent, owing probably to the greater amount of subjacent cellular tissue—its consistence is always great enough to prevent it from being rubbed off by the finger or with the back of a knife—where the adhesion appears lessened without simultaneous diminution of its consistence, large pieces of the mucous membrane may be separated from the subjacent cellular tissue. The solitary glands, neither of the small intestines

nor of the colon, are visible to the naked eye. As to those of the colon, however, we discover occasionally delicate roundish spots, presenting a contrast to the rest of the membrane by their opaque colour, but without any elevation. The villous layer, and the glands of Lieberkuhn, are also invisible. The Peyerian patches, on the contrary, may be discovered at the earliest period of life, when the intestine is held up to the light, owing to their greater opacity as compared with the rest of the membrane. Whenever these patches are recognized at first sight, a pathological state may be suspected. The largest of the patches are seated near the ilio-colic valve, where they may be discovered with a slight examination—the smallest are in the jejunum—those of the ileum are always distinguished by their marked limits. The number of the patches varies as much as from sixteen to thirty-six. The cases in which they are found to be only from four to six, are regarded by our authors as referable to atrophy of the mucous membrane.

In regard to the pathological states of the parts, we must restrict ourselves to the principal characters laid down by our authors.

I. Congestion.—1. *Of the mucous membrane itself.* A full red colour, varying from the rose to the cherry red, and excluding the violet and livid tints, is to be seen in little isolated spots, in patches of 1″ 2″, or even in arborizing trunks. Bifurcations of this colouring extend even over the normal patches. At the same time the adhesion of the membrane is not diminished—its consistence is. This congestive condition was seen alone, and also complicated with inflammation of the mucous membrane and its glands. 2. *Congestion of Peyer's glands.* Some of them are more readily visible than in the healthy condition, partly by their circumscribed redness, partly by the anormal development of their areolar structure, the septa becoming more prominent; at the same time the solitary glands, both of the small intestine and of the colon, are also more developed, and more easily recognizable, without, however, projecting above the level of the mucous membrane. This derangement is without doubt one of the most frequent causes of temporary diarrhœa, occurring, in particular, at the time of teething.

II. Acute Inflammation of Peyer's Glands.—1. *Primitive form.* About ten or twelve of these patches, as well elsewhere as near the ileo-colic valve, exhibit at first sight a saturated cherry-red colour throughout, and a considerable elevation above the mucous membrane. The redness is sometimes limited to isolated spots, while, in other cases, it affects the border or the whole surface of the patches. Their consistence appears also to be lessened. Those of the lower parts of the canal are for the most part less affected, the progress of the alteration being from above downwards. The mesenteric glands at the same time appear elevated in most cases, and somewhat injected, but of normal consistence. Our authors in such cases found the mucous membrane itself and the solitary glands either quite healthy, or, if morbidly affected, certainly not in connection with the alteration of the Peyerian patches. This morbid change was observed also by Rilliet and Barthez, but only in exanthematic fevers, and hence of secondary character, and somewhat analogous to the pathological states of typhoid fever. Our authors, on the contrary, found it in a primitive form, quite independent of any other disease, without any alliance to typhoid fever, but rather of true croupous character.—2. *Secondary form.* Deep redness of Peyer's patches, with elevation, and in some spots even ulceration. At the same time, ulcerative inflammation of the solitary follicles of the small intestine.

III. Chronic Inflammation of Peyer's Patches.—Several patches show a decided gray-blue, or rather a slate-gray colour, strongly contrasting with that of the mucous membrane, the colour of which is usually pale, and in rare instances, owing to chronic inflammation, livid-gray. The areolar structure of the patches is not unfrequently rather opaque, their borders, however, being distinct, and studded with black punctations. According to the stage at which death takes place, the tissue appears atrophied or elevated. In some cases, traces of inflammation of the mucous membrane and solitary glands were also observed; the mesenteric glands, on the contrary, were never essentially altered. Complicated tuberculization was never seen, but great tendency to complications in other organs, to lobular pneumonia, purulent effusion in the brain, &c., the cause of the fatal event. On this affection is founded Barrier's account of his "Diacrise Folliculeuse."

IV. Ulceration of the Solitary Glands.—1. *Primary Ulceration.* A greater or less extent of the ileum presents roundish ulcerations of a size varying from that of a millet seed to that of a lentil, corresponding to the solitary glands; the borders are firm, prominent, and sharply defined; the base considerably excavated, and filled with a yellow exudation. These occur isolated, near one another, or even confluent. Tuberculous deposit was found neither on the ulcerative surface nor elsewhere. The solitary glands of the colon, Peyer's, and the mesenteric glands, in the cases observed by our authors, were normal, or but accidentally diseased. 2. *Secondary Ulceration.* The difference between this and the primary form lies merely in the more intensely inflamed halo around the ulcerated glands. At the same time Peyer's glands seem to be constantly diseased, and both affections to be attended with tubercular deposits.

V. Softening of the Intestinal Mucous Membrane.—1. *Red Softening.*—There is here lessened consistence of the mucous membrane, more frequently in that of the small intestine, less frequently in that of the colon. The adhesion of the mucous membrane to the subjacent tissue is at the same time diminished, this defect of adhesion occurring at points where the consistence is still unchanged. Along with these appearances the mucous membrane sometimes exhibited a species of œdematous infiltration, or a homogeneous pulpy and readily lacerable mass. The simultaneous alterations of the solitary glands, Peyer's patches, and the mesenteric glands, are of subordinate importance. 2. *White Softening.* This differs from the former only by the paleness of the membrane, and the greater extent of the affection, owing to its longer duration. The patches of Peyer are, in such cases, most readily visible, not in consequence of any change on themselves, but merely of the unusual paleness of the rest of the membrane. On the whole, this form of disease appears to be merely the termination of an inflammatory state of the mucous membrane, or the gradual change of the red softening into the white—in favour of which view there are analogies in the case of other organs, witness the brain—and this is the side of the question taken by Rilliet and Barthez.

It is surprising that alterations so frequent and of such importance should have been till now so imperfectly understood. The French authorities have thrown them together, under the name of Entero-Colitis. But it is one of the most beneficial results of the investigation with which we have been engaged, that, with the exception of secondary acute inflammation of Peyer's glands, and secondary ulceration of the solitary glands, all the intestinal alterations in infants at the breast appear in most cases as idiopathic, and altogether independent diseases, without any simultaneous alteration of the other component parts of the mucous membrane. It is also very deserving of attention, that some of the alterations frequent in more advanced childhood, were never met with during the first year after birth—for example, membranous or aphthous formations, and independent ulcerations of the mucous membrane.

Conclusions.—1. Morbid alterations of the intestinal mucous membrane are a very frequent, probably the most frequent, *post-mortem* appearance in the infant at the breast. 2. When of a chronic character, these alterations lay the foundation of atrophy; when acute, their most prominent effect is exhausting diarrhœa, which, from the cerebral symptoms often attendant on it, was mistaken by many observers for softening of the stomach (gastromalacia). 3. The frequency of the alterations above described, is as remarkable as the rarity of those which were once believed to be of common occurrence; for example, enlargement of the mesenteric glands, aphthous formations, gastromalacia, &c. 4. It is also to be remarked, that the diseases of the intestinal tract are in general far more frequent than those of the stomach, which, with the exception of softening of the fundus, are proportionally rare at this period of life. 5. The ulcerations of the mucous membrane, unless when secondary, are in most cases isolated. 6. The most frequent of the alterations under examination, is chronic inflammation of the Peyerian patches; and this is the only anatomical base of atrophy. 7. Next to this, but far more rarely, the red and white softening are essential causes of atrophy. 8. Red and white softening are but different stages of the same morbid process; the simple and gelatinous softening give but a difference of form. 9. In atrophy of infants at the breast, chronic ulceration of the solitary glands of the small intestines is among the rare occurrences. 10. The acute inflammation of the Peyerian patches, though

hitherto little attended to, is among the most fatal of morbid alterations. 11. This is a true inflammation, as is attested by the attendant affections: for example, croupous lobular pneumonia. 12. This affection is generally unknown; and the few who are acquainted with it, commonly refer it to Dothinenteritis—a disease which does not occur in infants at the breast. 13. Secondary acute inflammation of Peyer's glands, as well as inflammation of the solitary glands, belongs to tuberculization; in all such cases, tubercles of the spleen were met with simultaneously, but never in the intestinal tract. 14. The colonitis of the French observers was often met with, but uniformly of small extent, and of subordinate importance, compared with the simultaneous, but far more serious, alterations of the mucous membrane of the small intestines. The mesenteric glands, with the exception of slight redness and elevation, in a few cases were, for the most part, normal; the alteration of these was never either considerable or prominent; in general tuberculization, it is true, they were infiltrated with tuberculous matter; but even then their enlargement could not be felt through the abdominal walls. 16. The peculiarity and frequency of the above described morbid alterations, and the absence of others, known to occur in the next year of life, as typhoid fever and abdominal tubercles, present features of great interest in the pathology of the alimentary canal during the first year of life.—*Month. Journ. Med. Science*, Sept. 1847, from *Zeitschrift f. Rationelle Medizin*, Bd. V. h. 3.

—

23. *On a new form of Serous Inflammation.* By Hughes Bennett, M. D.—In many cases which had come under Dr. Bennett's notice of apparent inflammation in the serous membranes, nothing whatever could be discovered after death but a slight effusion of serum. The membrane itself presented its usual white glistening appearance, free from all vascularity or deposition of lymph. The effusion in consequence had been considered non-inflammatory, and the connection between the symptoms and morbid appearances had been involved in the greatest mystery. An examination of such effusions with the microscope, however, had proved that in many such cases they contained pus cells in considerable quantity, and it seemed possible that such purulent formation was intimately connected with the symptoms which preceded death. In illustration of this observation, Dr. Bennett described three cases out of several he had met with.

The first case was one of fever under the care of Dr. Andrew, which appeared to be going on well, when one day, during the visit, the patient was seized with a distinct rigor, and pyrexia for two subsequent days, and died during the following night. On examination no lesion whatever could be anywhere discovered, with the exception of about one ounce of serous fluid of a golden yellow colour, and very slightly turbid in the peritoneum at its most depending part. The membrane itself was perfectly healthy. A microscopic examination of the fluid showed it to contain numerous pus corpuscles.

The second case was that of a woman who entered the infirmary under Dr. Douglas, with occasional convulsions, which had come on two days previously. She presented such marked symptoms of head affection as led to a suspicion of meningitis. She died in three days. On examination the membranes and substance of the brain were found quite healthy. Both lateral ventricles, however, contained each about ʒj of an opalescent fluid, on examining which microscopically, numerous compound granular corpuscles were observed in it.

The third case occurred to himself. It was that of a man who, for some time, had laboured under bronchitis. The day previous to his death, he was seized with pain in the cardiac region, tumultuous action of the heart, but without any murmur which could be detected by auscultation. He died during the night, and there was found, on dissection, considerable emphysema of the lungs with bronchitis. The pericardium presented a perfectly healthy appearance, but contained about half an ounce of an amber-coloured fluid, slightly turbid. A microscopic examination of this fluid exhibited numerous pus corpuscles in it, as in the first case.

Several other instances had occurred to Dr. Bennett, where inflammatory products could, in like manner, be detected in the effusions of serous cavities, which had been considered by practitioners of little importance, although, in his opinion, capable of explaining many anomalous symptoms.

Dr. Bennett also alluded to the importance of minutely examining the fluids in contact with mucous membranes. He had, on several occasions, detected pus globules in the urine, when nothing was visible in that fluid to the naked eye, and when it seemed perfectly healthy after a most careful chemical examination. In one such case in which Dr. Christison was consulted, and in which the urine was examined with great care, the symptoms of chronic pyelitis under which the individual laboured were inexplicable, until the microscope detected the pus globules. On the other hand, he had seen several cases, where fluids having, to the naked eye, all the appearance of pus, had been found in the bladder, ureters, or pelvis of the kidney, and yet not one pus corpuscle could be discovered, but only an immense number of epithelial cells, which had been thrown off in large quantities, and communicated to the urine a turbid, purulent-looking character. This had been well seen in two kidneys he had recently examined with Dr. Maclagan.—*Proceedings of Med. Chirurg. Soc. of Edinburgh*, June 13, in *Monthly Journ. Med. Sci.*, Aug. 1847.

—

24. *Atrophy of one Lung, with Cicatrized Tubercular Cavities.* By M. Payan, of Aix.—A woman, twenty-six years of age, went into the Hotel Dieu, at Aix, on account of a slight illness. She had been in the same hospital, three years before, with all the symptoms of confirmed tubercular phthisis,—namely, hollow and deep cough; abundant expectoration, at times tubercular; hectic fever, with circumscribed redness of the cheeks, &c. After remaining three months in the hospital, she returned home with no other prospect than of quickly sinking under the disease. Nevertheless the symptoms, after a time began to subside, and at length, she so far recovered her health and strength that she again went to service, having then no remains of her former complaints, but some constraint in breathing when she made an unusual exertion. When she went into the hospital a second time for a complaint of the stomach, there was no symptom of affection of the lungs. A few days after she was seized with influenza, which then (January 1837) prevailed severely in the town. Before the evening of the day on which she was attacked, the respiration had become much oppressed, with sense of approaching suffocation; and, in spite of every means of relief that could be devised, she died in the night with all the indications of asphyxia.

At the post-mortem examination, the body presented an ordinary degree of embonpoint. The left side of the chest was perceptibly less prominent than the right. There was nothing unusual within the skull. Between the right and left lungs there was a remarkable disproportion—the right being well developed, and filling its proper cavity; while the left, reduced to a very small bulk, was lost in the left thoracic cavity, being concealed by much laminated tissue. On minute examination the left lung was found to be much atrophied, and quite impervious to air. Its texture was hard and fibrous-like, somewhat resembling that of the supra-renal capsules. On cutting into it there was found a number of cavities, more or less extensive, appearing to communicate with each other. These were true tubercular cavities, smooth on their inner surface, and altogether empty. The right lung was simply in a state of congestion.—*Monthly Journ. Med. Sci.*, Nov. 1847.

—

25. *Observations on Hysteria.* By M. E. Marchand, of Sainte-Foy.—The following are the conclusions to which M. Marchand comes, in a memoir on Hysteria, read before the Royal Academy of Medicine at Paris:—

That aglobulia denotes a diminution in the blood globules, as hyperglobulia signifies an increase of the same, or plethora. Aglobulia is a very common morbid state. The blood globules—the medium proportion of which is 125 in a thousand parts of blood—may fall to so low a figure as 24, as Andral has remarked. M. Marchand has found it as low as 43. Aglobulia has for its discriminating mark a disturbance of the nervous system. This disturbance of the nervous system is, in general, the more decided the more complete the aglobulia is. The disorders arising from aglobulia, may affect either the nervous system of the functions of relation, or the nervous system of the vegetative functions. Under the first head fall convulsions, paralyses, hysteric lethargies, hysteric aphonia, hysteric asthma; disorders of the organs of sense, as amaurosis and double vision, and tinnitus aurium. Under the second head come various chlorotic phenomena, nervous

palpitations of the heart and great vessels, venous and arterial murmurs, failure of the complexion, certain disorders of the uterine function. In general, the diseases termed nervous, depend on aglobulia, or at least always coincide with it. Aglobulia is more frequent in women than men. The majority of women have a slight degree of aglobulia, which explains their nervous susceptibility, their exalted sensibility, and their many neuralgias. Sydenham affirmed that two-thirds of the female world suffer from hysteric symptoms. Women have a smaller proportion of blood globules than men; they are more subject to nervous maladies. This smaller proportion of the blood globules in them, may be ascribed to their periodical hemorrhage; for all hemorrhage diminishes the blood globules. The menstruation, then, has the effect of producing in females their pecular nervous susceptibility.

The nervous symptoms of the first months of pregnancy depend on the diminution of the blood globules. It has been observed, that nervous diseases have a tendency to subside after the critical age. It is equally an observed fact, that after this period of life the blood globules acquire an increased proportion, owing to the cessation of menstruation. In general, women bear blood-letting and spare diet ill, because these means favour the diminution of the blood globules, and exalt the nervous tendency. It has been said, with truth, that chlorosis is the basis of pathology in the female constitution. Hysteria is the aglobulia of females from twenty-five to fifty-five years of age; chlorosis is the aglobulia of young girls, and often of young men; hypochondriasis is the aglobulia of grown men. Proceeding on a different train of ideas, Sydenham conceived there is no difference between hysteria and hypochondriasis. A great number of chronic maladies,—but, in particular, syphilis, tubercle, cancer, and intermittent fevers,—gives rise to aglobulia, which is then symptomatic. Spare diet too long persevered in, too frequent venesections, produce aglobulia, and consequently nervous excitability. This happened very often at the time when gastralgias were mistaken for forms of gastritis; the means adopted as methods of cure prolonged the disease.

Antispasmodics sometimes calm nervous excitement, but never cure it. To produce a radical and complete cure, the blood globules must be brought back to their normal state; and the only mode of accomplishing this end is by animal diet, wine, iron, bitters. exercise in the open air, in the sunshine, residence in the country, sea-bathing, &c. When aglobulia is symptomatic, the same means tend to produce a cure. In the third stage of syphilis, and in old intermittents, it is found beneficial to unite animal diet, wine, iron, and bitters, with the antisyphilitic and febrifuge remedies. If the alteration of tissue be incurable (tubercle and cancer), iron may relieve, but cannot cure.

An increase in the proportion of the blood globules (140, 150, 170 per millimetre), or hyperglobulia, impairs the nervous sensibility, and leads to apathy. Those affected with hyperglobulia have diseases in general peculiar to themselves,—gout, gravel, cerebral hemorrhages. Venesection, spare diet, vegetable nourishment, alkaline waters, &c., are the best means of curing hyperglobulia.

To conclude, the functional derangements of the vascular system, and the functional derangements of the nervous system, arise in inverse proportion.—*Monthly Journ. Med. Sci.*, Nov. 1847, from *Gaz. des Hôpitaux.*

—

26. *Scrofula.*—(*Prov. Med. and Surg. Journ.*, April 7.)—"Scrofula," says Dr. Addison, of Malvern, "is a term used to designate a particular state or condition of the living body, rendered apparent by the phenomena of its nutrition and diseases. The term, whatever may have been its origin, seems, like many others in medical science, to have been handed down with reference to the human structure, for convenience sake, rather than for any other reason. Writers upon the subject of scrofula, for the most part, reiterate one after another, certain external appearances in the general contour of the person; in the eyes, lips, nose, countenance, or complexion, by which, they say, those individuals who are scrofulous, may be distinguished from others who are not so. But we shall hereafter show, that no satisfactory practical distinctions can be safely made upon such grounds, the constitutional disposition not declaring itself until the qualities of the textures, and their capacity of withstanding injurious influences, have been tested and declared by some irritating or disturbing cause, giving rise to an unusual local increase of

nutritive matter; when the form of the morphology or metamorphosis—the conformable or unconformable type of the changes—pronounces the constitutional diathesis.

"If there be one fact better established than others, in respect of scrofula and scrofulous diseases, it is their hereditary character, the offspring exhibiting bodily and mental powers, and forms of disease similar and analogous to those which have been known to exist previously in one or both parents. This transmission of structural or constitutional and other qualities, from parent to child, is one of those remarkable facts in living bodies, which we look to the recent rapid advances of physiological science to elucidate. To say that children inherit the dispositions and diseases of their parents, and to rest content with the barren assertion, is to leave to conjecture questions of the highest interest to medical and moral science. If the lineaments of the face, the colour of the eyes and hair, the tones of the voice, an ear for music, and mental aptitude, be handed down from father to son, they must be so by a wonderful consentaneous harmony of organization—an almost incredible conformability in the morphology of nutrition; and if the physiology—if the constitution, temperament and mind, be so similar, then, however little we may be able to explain the fact, it follows almost necessarily, that the pathology and diseases will prove so too;—not scrofulous diseases exclusively, but all others also.

"'The most certain evidence of the existence of a scrofulous disease,' observes a recent medical writer, 'is afforded by the production of a soft brittle unorganized matter, resembling curd or new cheese, which is found mixed with the contents of abscesses, or deposited in rounded masses of different degress of firmness, and varying in bulk from the size of a millet seed to that of a hen's egg; sometimes it is enclosed in cysts, and occasionally it is diffused, as if by infiltration, through the natural texture of the part. To the rounded masses of this substance, the name of tubercle has been assigned, and the substance itself has been named tuberculous matter.'"

---

27. *Seat and Nature of Tubercles in the Lungs.* By William Addison, of Malvern.—Tubercular consumption and phthisis are terms used to designate that species of disease which consists in the filling up of the air-cells of the lungs,* and the destruction of their vascular walls by a soft, brittle, white matter, named tubercle or tuberculous matter. The best and most recent pathologists have differed in their statements and opinions regarding the seat and nature of tubercles in the lungs, nor are they agreed as to the changes they undergo. Laennec describes them as small firm bodies, which gradually enlarge, then soften, and by degrees become converted into a liquid mass. Andral differs somewhat from Laennec; he says, that tubercles soften, not from any spontaneous changes in themselves, but from an admixture of purulent matter poured out from the living texture immediately surrounding them. Dr. Carswell states, that tubercles originate from morbid changes in the blood, and that their most frequent seat, is the surface of the mucous membranes; this author believing, in common with many others, that the membrane of the air-cells of the lungs is a mucous membrane. Dr. C. J. B. Williams states, that "lymph, pus, and tubercle, pass by imperceptible gradations into each other;" and in this opinion I concur, in so far as that pus may pass into tubercle or mucus, or into a mixture of tuberculous and mucous matter, but the converse never can occur.

Tubercles exist in the lungs more frequently than is generally imagined. Of the numerous apparently-healthy lungs which I have examined in the course of my researches, I have found them in about one-third. In their early state they escape notice, unless searched for with a lens in very thin sections, gently extended upon a dark back-ground. In order to make out correctly the primary situation of a tubercle, the examination should be made in the lungs of young persons, who have died of other diseases; for in those who die of consumption, so many changes have taken place, and the several textures of the lungs have been so altered, that it is impossible to find tubercles in that early condition in which alone their situation, in or upon the membrane of the air-cells, can be determined.

* Dr. Cumin in *Cyclopædia of Practical Medicine*, vol. iii. p. 701. Art. Scrofula.

I have repeatedly examined with the microscope the material deposited in the air-cells of the lungs in *pneumonia*, and compared its characters and appearance with that forming a tubercle, without being able to detect any more essential or constant difference between them, than exists between recently excreted and old pus. The same class of objects—incoherent colourless cells, molecules, and granular matter, appears to constitute the material in both cases—in hepatization or consolidation of the lung from inflammation, and in consolidation from tuberculous matter; and in both cases also, the material takes primarily the shape of the air-cells in which it is seated. In the material forming the consolidation resulting from inflammation, incoherent cellular forms predominate, as they do in recent pus; whereas in tuberculous matter, granular masses and molecules greatly predominate, as is also the case in old pus. And were we to imagine the fluid element of old pus, removed or absorbed, the remaining solid matter would be, in my opinion, tuberculous matter; the colourless elements of blood, pus, and tubercle passing by imperceptible gradations into each other.*

In pneumonia, the consolidating material is, as it were, suddenly thrown out over a wide extent of lung. All the blood-vessels are loaded with colourless elements. The blood itself, when withdrawn, assumes a buffy coat, and the texture, from the various blendings of the red colour of the blood, with the white colour of the new material separated from it, assumes various hues between dark red and whitish yellow.

In phthisis, on the other hand, the consolidating material is deposited at distant points, in a much slower manner; it becomes, as it were, old, before it becomes visible, and I have seen sections of the lung display an appearance precisely analogous, and indeed very similar to that of the face in small pox, and this in a patient who did not die of consumption.

My researches have been in like manner extended to the characters and appearances presented under the microscope by the material taken from pimples, boils, and all kinds of eruptions on the skin, and in all these instances, incoherent colourless cells, granular matter, and molecules, have been found in the greatest abundance. Moreover—and it is a fact of much importance—the same objects have been profusely detected, not only in the fixed textures surrounding the morbid matter, but likewise in blood taken from the vessels, administering to their nutrition. And it would appear, that when any texture becomes involved in a hurtful or destructive inflammation, or in a tuberculous or scrofulous disease, that its physiological type is altered, and its function impaired; the structural elements, whatever may be their normal qualities or characters, become more and more uniform, and at length corpuscular, the corpuscles being apparently identical with those circulating in the blood.

It has been said, that tubercles arise from "an error of nutrition," which is perfectly true, but no practical advantage is derived from the use of a few words which are applicable alike to all diseases.—*Prov. Med. and Surg. Journ.*, April 7th, 1847.

—

28. *Abscesses of the Liver opening into the Bronchi.*—M. Raiken, in a memoir read before the Belgian Royal Academy of Medicine, has collected accounts of eight cases of abscesses of the liver opening into the bronchi, some of which occurred under his own observation. He regards these abscesses, as eventually curable by the powers of nature, when they can discharge themselves through a fistulous canal, commencing at the suppurating part, and passing on till it reaches and opens into one or more of the bronchial ramifications. On the other hand, it appears from eleven observations, based on pathological examination, that in cases where death has followed the opening of hepatic abscesses in the lungs, the suppurating cavity has not directly communicated with any one bronchus by an intermediate fistulous canal; but, on the contrary, its contents have made their way mediately to the bronchi—*i. e.*, through the intervening tissues, depositing

* By the term *old pus*, the reader will understand that I mean *matter* which has been a long time excreted, and in which the corpuscles or cells having broken down, there remains a thick, more or less fluid material, composed of granular forms and molecules.

here and there in the lungs, the pleura, and other parts, some portion of themselves, in the form of masses, or of infiltration.

The reddish, thick, fœtid, purulent matter, compared to the washings of meat, often found in chronic abscesses of the liver, is very probably the result of decomposition of the pus, or of the pultaceous softening of the surrounding hepatic tissue; and although death does not inevitably follow, such matter shows great danger, on account of the suppurating cavity in the liver not being circumscribed throughout by an adventitious cellulo-vascular membrane, adapted for and favouring cicatrization.

Pus, actual bilious matter, liquefied and decomposed detritus of the hepatic tissue, biliary calculi, acephalocysts, or laminæ of vesicular bodies, coming from an abscess or cyst opening into hollow organs, lined with mucous membrane, as the bronchi—all these various products may, by the aid of an adventitious fistular canal, find their way into such organs, pass through them, and be rejected externally, without there following any functional disorders or material alterations incompatible with life or necessarily fatal.

The presence of bile in the pus of chronic abscesses of the liver must not always be looked upon as a certain proof that these abscesses are without an enclosing cellular wall, since it is not uncommon to meet with bile in encysted bodies, both in hydatid cysts, and in abscesses truly surrounded by an investing tunic.

The pus of chronic hepatic abscesses generally possesses an ammoniacal odour, but is sometimes inodorous.

In forming a diagnosis of chronic abscesses of the liver, the general history of the patient must be considered, and the absence of any disease about the lung or pleura noted. This being determined, we may have recourse to those signs more immediately pointing to disease and abscess of the organ. The slight suffering, which has hitherto attended the disease, when the abscess begins to point and seek an exit for its contents, increases in intensity; there is an acute, stabbing, burning, and heavy pain on the right side, corresponding to the seat of the abscess, and sometimes a fluctuation may be felt. Then, on the abscess bursting in the lungs, there is suddenly excessive dyspnœa, threatening suffocation, orthopnœa, inexpressible anxiety, loud and incessant tracheal and bronchitic rattlings, fœtid breath, an excrementitial taste in the mouth, sudden expectoration of puriform, acrid, and fœtid matter, brown, or reddish, or streaked with blood, sometimes mixed with bile, containing broken-down debris of hepatic substance, of biliary calculi, of hydatids, or of laminæ of acephalocysts. Whilst these phenomena present themselves, an unusual dulness is observed on one side of the thorax, generally the right, with the absence of the respiratory murmur, but without tubular breathing, or resonance of voice, or ægophony, or metallic tinkling, or any sound on succussion, or any enlargement of the side. If the ear be applied over the region of the liver, an evident gurgling is heard, extending to the base of the lung, whilst compression over this region immediately produces a copious expectoration; and lastly, the signs indicating a collection of fluid matter in the liver gradually decrease in number and intensity.

In cases where the symptoms of the discharge of matter from the lungs do not abate, the patient gradually succumbs, worn out by a sort of consumption. When, on the contrary, a gradual and progressive amelioration manifests itself—when, about the base of the lung, where the dulness existed, a mucous râle begins to be heard, followed up by the gradual appearance of the respiratory murmur, and the metallic tinkling or gurgling over the region of the abscess ceases to be appreciable—when compression over the hypochondrium is no longer painful, exciting no further dyspnœa, or expectoration of puriform matters—lastly, when all the disorders of the organism which attend hepatic abscess continue to decline day by day,—we need not despair of recovery. When a cure takes place in cases of hepatic abscesses, or hydatids, discharging themselves through the lungs, we must, in general, suppose the sac of the abscess to collapse, and adhesions to occur between its walls, so that only a cicatrix is left behind. But in order for such a happy result to occur, the walls of the sac ought to be but recent and thin, for when they become old, thick, and even cartilaginous in consistence, the power to collapse is lost. The question then arises, can a cure be effected when the sac is

thus dense and wanting in collapsibility? We can suppose it may, if its interior do not go on secreting pus, its walls becoming healthy, and if the sinus leading from it externally become obliterated. Then it would exist but as a serous cyst, like those sometimes met with in the brain, but not perceptibly interfering with the functions of the liver. And may not the cavity of the sac become gradually filled, in some cases, by solid areolar tissue, produced after the manner of granulations from its walls?—*Lancet*, Sept. 18.

An interesting case of abscess of the liver, opening into the lungs, which terminated fatally, is recorded in the *Lancet* (July 17th, 1847) by Dr. A. T. Thomson, with some judicious clinical remarks.

—

29. *Thymic Asthma.*—Dr. Herard has made this disease the subject of an inaugural thesis. He observed numerous cases of it in the Children's Hospital, at Paris, and considers it to be the result of spasm of the glottis, or of the diaphragm, and conceives there are three forms of it, according as one or the other, or both these organs are the seat of convulsion. When the spasmodic attack is limited to the glottis, the respiration, he says, is simply arrested for a few seconds, and is restored without the production of the special cry produced by inspiration during convulsion of the diaphragm. In the second form, in which the diaphragm *alone* enters into spasmodic action, the attack is marked only by several successive and sonorous inspirations; the symptoms of asphyxia are not by any means so well marked as in the first variety which we have described, because the glottis does not participate in the convulsion. In the third form, both the glottis and diaphragm are simultaneously convulsed, respiration is first suspended, and one or more sonorous inspirations are heard, and, not being followed by expiration, asphyxia is soon imminent; these sonorous inspirations resemble the crowing of hooping-cough, and are produced by the same cause. Death may occur—1, during the attack from asphyxia; 2, it may result from cerebral congestion; or, 3, be the consequence of gradually increasing debility.

On dissection of the bodies of children who have died of this disorder, M. Hérard asserts, that no characteristic alteration can be detected. As to the hypertrophy of the thymus gland, Dr. Hérard refuses to admit that it has anything to do with the production of this form of asthma, and shows, from carefully drawn-up statistics, that the volume of the gland is in harmony with the state of health or weakness of the constitution, and not with the presence of asthma. It is not a little singular that anatomists should disagree on a point which would, at first sight, seem so easy to ascertain, as the question of the normal size of an organ; and it is not without surprise, that we find Meckel averaging its weight at twenty grammes, Burdach at twelve grammes, Haller at eight or ten, and Haugsted positively asserting, that in children of the same age, the gland may weigh from four to twenty grammes! Haugsted is much nearer to the truth, according to Dr. Hérard, who attributes the great size of the thymus entirely to the vigorous constitution of the child. The Germans place in the brain the cause of this malady, and refer it to an "arrêt de développement," marked by the incomplete ossification of the fontanelles, the enlargement of the liver, the patency of the foramen ovale of the heart, the late evolution of the teeth, and the hypertrophy of the thymus. Dr. Hérard cannot adopt this view, and observes, with much reason, that it is precisely in large, well-formed children that the thymus is found in a state of hypertrophy. Dr. Corrigan has considered inflammation of the cervical part of the spinal cord as a cause of spasma glottidis, and has published an interesting case in the *London Medical and Surgical Journal.* (1836), to illustrate this position. But this case, in which spinal irritation, at least, seems evidently to have produced the convulsive symptoms which now occupy our attention—this case has remained solitary; and, whilst it compels us to admit that it may occasionally bring on spasmodic contraction of the glottis, it leaves us at liberty to admit that it is far from being its only cause. The anatomical alteration which Dr. Hérard has met with constantly, viz., pulmonary emphysema, cannot by any means be looked upon as a cause, but as an effect of thymic asthma.—*Dr. M Carthy*, in *Med. Times*, Nov. 6, 1847.

—

30. *Thymic Asthma.*—In the *Abeille Médicale.* we find recorded several cases of this disease which terminated fatally. The author, Dr. Pury, found on dissection

a remarkable development of the thymus gland, and does not hesitate to ascribe the disease to the pressure of this enlarged body upon one or both lungs. He conceives that the morbid condition of the thymus recognizes for its principal cause a scrofulous hereditary predisposition, and a certain unknown and unhealthy condition of the maternal milk.—*Ib.*

31. *Post-Pharyngeal Abscess.* By Dr. Bessems.—This kind of abscess is either idiopathic or symptomatic; the latter is dependent on caries of the highest cervical vertebræ, and can hardly be mistaken. The idiopathic abscess, on the contrary, is sometimes difficult of diagnosis. To the idiopathic abscess the following observations are limited. This kind of abscess is confined to no period of life; but, as far as the cases hitherto recorded show, it is most apt to occur in early infancy, as from the age of a few weeks up to four years.

It has been observed to follow wounds or punctures, as from a wound of the back of the neck, and from puncture in swallowing a sharp-pointed bone, the irritation produced by a difficulty in deglutition, inflammation of the mucous membrane of the pharynx, dentition, and to have been connected with rheumatic disease, erysipelas, and also inflammation of the contents of the cranium.

It begins at different points in the posterior wall of the pharynx, and may be circumscribed or diffused. Above, the pus is confined by the petro-pharyngeal and occipito-pharyngeal aponeuroses; and in front by the deep layers of the cervical aponeurosis. But, notwithstanding the last-mentioned obstacle, the abscess sometimes extends to the sides of the neck, forming there tumours more or less voluminous. Beneath, there is nothing to confine it, so that it may even descend along the gullet into the posterior mediastinum.

This kind of abscess may be either acute or chronic, the former being more frequent. In one recorded case, however, the disease proved fatal by suffocation, after lasting for five months; and in another, which Desault cured by evacuating the pus, seventeen months had elapsed from the first appearance of the swelling; in a third, cured by Dr. M. Wade in the same manner, the patient had suffered severely from the disease for three months.

In the inflammatory stage pain, not always severe, impeded deglutition, most frequently redness of the pharynx, great stiffness of the neck, and even projection of the posterior wall of the pharynx, are present. Sometimes this last symptom is better ascertained by exploration with the finger than by inspection. When the stage of suppuration arrives, besides the ordinary constitutional effects of suppuration, increased difficulty of deglutition, rejection of fluids by the nostrils, noisy breathing, cough, alteration of the voice, and even symptoms imitative of croup arise. When the seat of the pus is low, the difficulty of discovering the tumour is great. By external examination of the neck, much assistance is often obtained and a displacement of the larynx is at times discoverable.

The difficulty of the diagnosis is much increased by the tendency to disorder of the stomach and of the brain under this disease of the pharynx. In one of the fatal cases recorded—in an infant, a year old—the disease set in with convulsions, and the true nature of it was not discovered till after death, though repeated examinations of the throat and neck were made, and it was discovered by the stethoscope that the lungs, bronchi, and trachea were free from disease. This disease was finally believed to be in the larynx, and tracheotomy proposed, which was refused by the parents. In this case the introduction of the finger would probably have discovered the nature of the disease in time to have saved the infant's life.

Nothing but an attentive examination of the pharynx can prevent this disease from being confounded with croup. In every case then resembling croup, the pharynx should be carefully explored, and this is more particularly necessary where no false membrane has made its appearance, or when the disease has shown the same intensity of symptoms for several days without a marked progress. In post-pharyngeal abscess, the difficulty of deglutition precedes that of respiration, which is not the case in croup, as there is no difficulty of deglutition unless where that disease is combined with cynanche tonsillaris; in post pharyngeal abscess, pressure on the larynx increases the labour of the respiration, which does not occur in croup.

It appears that this disease has been mistaken also for œdema of the glottis; but in the latter affection the difficulty of respiration, as compared with the facility of expiration, should be a sufficient ground of distinction, since in the former both are alike impeded.

When post-pharyngeal abscess assumes the chronic form, numerous errors of diagnosis are apt to occur; it has even been mistaken for polypus of the nose. R is enough to indicate the possibility of such errors to prevent their recurrence.

In some cases the abscess opens, and the pus being discharged by the mouth the patient recovers; in others suffocation takes place by the opening of the abscess; in others death occurs by asphyxia, owing to the compression produced by the size of the abscess; and lastly, in protracted cases, the fatal event is the consequence of defect of nutrition, owing to the interruption to deglutition.

When the abscess is recognized in sufficient time, and opened artificially, the patient seldom fails to recover.

The treatment in the inflammatory stage is obvious. Several methods of opening the abscess have been recommended, as the nail, the finger, or the handle of a wooden spoon. A bistoury, wrapt round with linen, or Petit's pharyngotome is often necessary. In some instances the abscess has to be opened in the neck, in which case the surgeon must proceed with much caution.—*Monthly Journ. Med. Sci.*, Aug., 1846, from *Gazette Med. Chirurg.*, 16 and 23 May, 1846.

—

32. *Obliteration of a considerable portion of the Vena Cava inferior of some years' standing.*—Dr. Francis communicated to the Manchester Pathological Society, Aug. 5, 1847, the particulars of a case, in which a considerable portion of the vena cava inferior had been obliterated by inflammation some years previously to death.

The following is an account of the dissection of the vessel, and its afferent branches.

On reflecting the small intestines to the right side, an immensely dilated vein, running along the spine, close to the root of the mesentery, was exposed. This vessel—the left spermatic vein—was distended with blood, and had formed the main channel of the circulation from the lower half of the body. Above, it passed into the left renal vein, which also was proportionably increased in size downwards: after crossing the margin of the pelvis, it reached the ovary and left side of the uterus, along which it passed to the cervix. At this point it became lost in a large plexus of swollen veins surrounding the neck of the bladder, the vagina, and the rectum.

The whole of the vena cava below the renal veins, together with the common, the internal, and external iliac veins were completely obliterated. They were imbedded in a mass of strong, dense, fibro-cellular tissue—the result of inflammation that had extended around them. Their walls were thickened, and were, for the most part, firmly glued together, although in one or two places this had not happened.

The branches of the internal iliac vein about the pyriformis, and great sciatic hole were also obliterated, whilst the obturator veins were immensely enlarged and distended. There was no obstruction below Poupart's ligament; the femoral and saphæna veins communicated as usual; and about this part there were a great many large and abnormally developed veins, many of which were taking a direction towards the lower opening of the pelvis, and the obturator foramen.

The arteries, corresponding with these vessels, presented no abnormal appearances; the iliacs were accompanied each by a rather large vena comes.

In the lungs were several small vomicæ, with pneumonia and bronchitis; and in the left, a rather large vomica, lined with cicatrix tissue, and much puckered and contracted. There were many adhesions about the ovaries, and broad ligaments.

The patient, a woman 34 years of age, had been for nearly three years, from time to time, under Dr. Francis's care in the Manchester Workhouse. The symptoms which had induced her, during this time, to apply for relief, were always referred to the chest; and, indeed, the stethoscope had, from the commencement, detected the cavity in the chest, spoken of above. In addition to the chest affection, however, it was remarked that her legs were always much swollen, so that she was accustomed habitually to wear bandages around them. This swelling

was of a firm and elastic kind, and did not pit upon pressure, after the manner of ordinary dropsical structures.

Among the most interesting features in the present case, attention was drawn to the unusual circumstance of the occurrence of so severe, and extensive an inflammation of the vena cava—and more especially of its termination in recovery. The remarkable manner, too, in which a compensating circulation had become developed, was particularly referred to.

In another case, which had been published by Dr. Black, where the inflammation, and obstruction of the cava had occurred at that portion of the vessel which is lodged behind the liver, the current of blood had been directed chiefly through the epigastric, intercostal, and mammary veins, whilst in other cases the vena azygos had taken upon itself the chief additional burden. In the present instance, however, the left spermatic vein had been chiefly instrumental in maintaining the circulation, having been fed by the obturator, the superficial, perineal, pudic, and other veins, which, in the ordinary state of parts, are small and insignificant. In regard to the cause of the phlebitis, no certain information could be gathered; it is probable, however, that it resulted from some affection during the puerperal state, which she is known, from collateral evidence, to have passed through with some difficulty.—*London Medical Gazette*, Oct., 1847.

—

33. *Skoda's Treatment of Pneumonia.*—Dr. Geo. W. Balfour, in a paper read before the Medico-Chirurgical Society of Edinburgh, and published in the *Edinburgh Med. and Surg. Journ.*, (Oct. 1847,) gives the following account of the treatment for pneumonia pursued by Dr. Skoda in the General Hospital, Vienna.

"On entering on his duties, Dr. Skoda treated this disease according to the most approved principles. He drew blood from the system; leeched and blistered freely; giving at one time tartar-emetic in various doses; at another employing mercury equally freely. Becoming, however, skeptical as to the amount of benefit derived from such heroic treatment, he gradually left it off; and now nauseants and mercurials are equally unknown. Leeches, cupping-glasses, and blisters are never employed, and general bleeding only where the fever runs high, and the dyspnœa is great, previous to hepatization. After this has occurred, he regards the abstraction of blood as injurious, diminishing the chance of a speedy and complete absorption of the exudation. If dyspnœa or cyanosis be occasioned by a secretion of tough mucus, an emetic is given. His general treatment consists in giving a scruple of *Extractum graminis, ext. Glycyrrhizæ*, or some other equally innocuous extract; from ten to twenty grains of nitre, or latterly a quarter of a grain of corrosive sublimate, by way of attempting to reduce the plasticity of the blood. These remedies are dissolved in from six to eight ounces of water, and given, often warm, in the course of the day. From six to eight grains of Dover's powder are occasionally employed, or a grain or two of opium is given, according to the amount of pain and irritation present. Many patients are treated wholly without opium. All have a thick warm cloth (umschlag) laid over the chest. The temperature of the wards is about 60° F. summer and winter; and though well aired during the former season, they are close and ill-ventilated during the latter. The diet is in conformity with the habits of the people, and not more rigid than in other hospitals."

This method of treatment has been pursued, Dr. Balfour states, for three years, and the results have been most satisfactory.

—

34. *On the Recent Differences of Opinion as to the cause of Scurvy.*—[Dr. Andrew Anderson in an interesting paper, read to the Medico-Chirurgical Society of Glasgow, Aug. 10th, 1847, and published in the *Monthly Journ. Med. Sci.*, (Sept. 18th,) endeavours to reconcile the opposite opinions which have been expressed as to the cause of scorbutus, and to show how different articles may be anti-scorbutic. He observes, we know—]

1. That it has been proved by authors, that while any debilitating and depressing agency may predispose to scurvy, its essential cause is improper food.

2. That food, to support human life, must contain fibrin, albumen, or casein—it signifies not whether they be of animal or of vegetable origin; and that to pro-

vide sufficient fuel for maintaining animal heat, non-azotized substances must in general be added, no matter whether they be amylaceous, saccharine, or oily.

3. That if nitrogenous food be absent, the body cannot be nourished, give as much of the other as you choose; and that if the latter be withheld, and the former taken in quantity sufficient to supply carbon to the oxygen absorbed, the system is apt to get loaded with superfluous nitrogenous matter, and gout, or worse, may follow.

But how is it that, both being given, the blood, if they alone be given, still becomes depraved, and scurvy is the consequence? It were easy to see a reason for this, if in all instances in which scurvy occurs, the quantity of nourishing food were, as in the Perth prison, too small; but there is abundant evidence to disprove this. Thus Dr. Curran (*Dublin Journal*) records a very bad case, in the person of a woman who had been fed on plenty of butcher meat, and bread and butter, tea and coffee, wine and porter. Dr. Ritchie saw one parallel to this; and during the discussion on Dr. Christison's paper in the Edinburgh Medico-Chirurgical Society (*Edinburgh Journal of Medical Science*, June), it was stated that the disease had occurred in a boy over-fed with animal food, and in a lady whose diet was butcher meat and milk. In these instances the food abounded in both varieties of the elements needful for nutrition, and yet it did not nourish well. How was this?

To find what was yet required, let us revert to the history of the prevention and cure of scurvy by lemon juice. This substance contains but 2 per cent. of solid matter, of which 1·77 is citric acid—(Christison's Dispensatory, *in loc.*) Four ounces daily will shortly cure a bad case of scurvy, and yet can contain no more than 40 grains of solids—solids too, which are not nitrogenous. This cannot possibly furnish pabulum to make the blood nutritious; and yet it removes the malady. The lady whose case I have just cited was rapidly cured by oranges, her diet being otherwise unchanged; in explanation of which I venture to suggest the following hypothesis:—

Food appropriate to man must consist of three parts—the nitrogenous, to nourish; the non-nitrogenous, to produce the extra heat required; and a third element, to aid in the assimilation of these. This element is furnished by the various, usually more or less acid, juices contained in vegetables and fruits. In favourable circumstances man may dispense with these, and live in tolerable health, but withal obnoxious to disease; and if he be weakened, as by confinement, or depression, or previous disease; or if the nourishment in the food be moreover scanty, as it was in the case of the prisoners at Perth, scurvy comes on.

All the substances eminent as anti-scorbutics contain more or less acid; and it is proved that the more acid the fruit, as Dr. Trotter found of guavas, the greater is its virtue.

I presume then that these juices and acids act, not by themselves supplying nourishment for the blood, but by in some way promoting the assimilation of the nutritive part of the food; and I would compare their efficacy in scurvy to that of iron in anæmia. The anæmic patient may be fed exceedingly, but he cannot assimilate the nutriment he digests without the aid of a metal which itself can be no pabulum to the blood. And so the scorbutic may eat enormously of flesh, which is blood (Liebig), yet cannot change it into *his own* blood without the aid of certain vegetable matter; an aid which seems essential, though how it is given no man can tell. Vinegar and nitre, and one or two substances besides, have been found to cure scurvy now and then (by Henderson, &c.), but they have failed at other times. They probably exert in the process of assimilation an agency more or less like that of citric acid, although not so uniform or powerful; and so I suppose that milk may, by means of the *lactic acid* produced while it is digested, and not by means of its casein, effect in some instances the cure of scurvy. If it did so in virtue of the casein it contained, cheese should have the same effect,—a thing I never heard of. And milk, like vinegar and nitre, seems to fail more often than it prospers; for Drs. Curran, Lonsdale, and Ritchie record cases of the disease as having happened in persons making free use of milk.

When the diet is nitrogenous enough, lemon juice will be more useful; but when, as in the Perth prison, it is not so, milk may be the best anti-scorbutic, because it will supply the essential food of the blood, as well as what I may call its

condiment. That is, milk alone may in such a case be preferable to lemon juice alone; but, no doubt, "both are best."

Why is there sugar in milk? Not to form flesh of course. Not to produce caloric either; butter would serve that purpose well enough. The casein to nourish,—the oil to heat—is it not possible that the lactine may be intended to promote the assimilation of these by being first changed into lactic acid (as all nurses know it is), and by then supplying to the infant the want of that vegetable food which he does not receive, and could not digest; for the purpose, in short, of preventing scurvy? Dr. Andrew Buchanan well suggests that the *experimentum crucis* were to try whether *whey* would cure a man of scurvy.

And how do potatoes nourish men so well (*teste* Hiberniâ) that no other article of food will singly keep them in such health? Mr. Crum had shown (Philosophical Society of Glasgow) that four pounds of potatoes contain about as much albuminous matter as an egg:—the root then affords starch to heat, and nitrogen to nourish; but peas and beans, which do as much, will not serve as man's sole food. They are deficient in the third, the anti-scorbutic element, which Baly has shown to be possessed by the potato; hence its surpassing value—it is *milk for men.*

May we not in some such way as this, reconcile Dr. Christison's observations with common notions? The analysis which I am about to quote, prove that there is no necessary lack of fibrin in scorbutic blood; nay, that even in severe cases that element may be unnaturally plentiful, and the corpuscles, moreover, not much diminished. The darkness of the colour of the clot, and its occasional jelly-like consistency, indicate no doubt a depraved condition of the blood; but the startling rapidity of the cure by lemon-juice, appears to show that the error is in its vital structure, rather than in its chemical composition; and is repaired by putting into their right places, as it were, nutritive molecules already present in the fluid, rather than by the more tedious process of absorbing and adopting new materials.

When scurvy, however, does break out, it soon brings on anæmia; and then, of course, the corpuscles and the albumen are both progressively reduced in quantity, while the fibrin and the salts remain unchanged.

—

35. *Scorbutus as observed in the Salpêtrière in* 1847; *and on the Composition of the Blood in this Disease.* By Dr. A. Fauvel.—Since scorbutus, yielding to the progress of hygiene, has almost disappeared in localities wherein it was heretofore endemic, no important work has appeared upon the history of this disease, of which the physicians of the last century have described the frequency and terrible effects. The work of Lind, so replete with facts and erudition, has not been surpassed, and the picture he sketched of the symptoms of the disease has served for the model of the most recent descriptions. The researches upon the composition of the blood in various diseases, undertaken with so much *éclat* in our own times, has, however, recalled the attention of physicians to this malady of a prior epoch. The reason of this new interest may be readily understood, when we consider that the fate of an entire doctrine depended upon the solution of the problem of the condition of the blood in scorbutus.

Chemistry having confirmed the importance of the inflammatory crust of the blood which clinical experience had long since ascertained, it was next inquired, whether, in another pathological condition, an inverse appearance of the blood did not correspond to an inverse chemical change. This question was only imperfectly answered by the analysis of the blood in some of the pyrexiæ, since in these a diminution of the fibrine was found to be far from manifesting itself as a constant fact in these diseases. Was it otherwise in regard to scorbutus? Everything led to the supposition. The dissolved state of the blood, mentioned and differently interpreted by Hoffman, Boerhaave, Huxham, Lind, and many others, gave a great probability to the conjecture: while Magendie succeeded in inducing phenomena in animals, analogous to those of scorbutus, by the injection into the veins of defibrinated blood or alkaline solutions.

Such was the state of the question when, in 1841, Andral, analyzing the blood of a man affected with scorbutus, found the proportion of fibrine less than the normal mean; and from that time the former conjectures were considered as confirmed; a rational explanation of symptoms was given; and an ingenious theory of hemorrhages, which appear in certain diseases of which scorbutus may

be considered the type, was furnished. In the phlegmasiæ in which there is an increased quantity of fibrine in the blood, no hemorrhagic tendency is observed; but in typhus, scorbutus, and in other diseases in which the blood is in a more or less dissolved state, that is containing little fibrine, hemorrhages are frequent, and are produced independently of the essential differences which separate the various diseases. The hemorrhage is then a common phenomenon, dependent upon a common change in the composition of the blood in all these cases. If to this we add, that in certain other morbid states, in which the quantity of globules is greater than in the normal state, at the same time that the fibrine is unchanged, the hemorrhagic tendency is produced but with different characters, we naturally arrive at the distinction founded upon a change in the composition of the blood peculiar to each of these.

In vain did Mr. Busk declare that in several scorbutic patients he had found the fibrine augmented: and in vain did M. Stæber refer to the conclusions of Parmentier and Deyeux that the scorbutic blood they examined was identical with inflammatory blood. These statements were received with incredulity, as arising from some error in diagnosis or the process of examination. Yet it was desirable that new and numerous analyses should sanction the principle laid down by M. Andral from a solitary case: and this year an unusual opportunity offered itself to me at the Salpêtrière. Among the old women there, a few spots of ecchymosis on the limbs are not unfrequently seen: but for more than a year no case of scorbutus had shown itself; when last March, a woman æt. 76, strong and well for her age, became suddenly attacked by symptoms of it. Certain of these symptoms led to her being bled, and as no inflammatory complication was present, the usual state of the blood described by authors was expected to be found; but to my astonishment next day I found the clot covered by a yellow, firm, elastic, fibrinous layer, just such a one as is met with in simple pneumonia—the remainder of the clot offering no signs of dissolving. MM. Becquerel and Rodier were made acquainted with this unexpected result, and as a little epidemic of about thirty cases manifested itself during the next two months, they had ample opportunity of instituting more exact inquiries into the condition of the blood. The blood of five patients were submitted by them to analysis, and the following are the conclusions arrived at by these able chemists.

"1. That far from presenting a dissolved state, as the usually received theory supposes, the blood in these cases offered a well separated, and sometimes very firm clot, swimming in a limpid serum uncoloured by the presence of globules. 2. The density of the defibrinated blood was in all the cases below the normal mean (1057), and the figure 1038·3 observed in one case was lower than had ever yet been met with by MM. B. and R. Moreover this diminution of density, in the five cases, was not in relation with the respective proportions of water and solid matters of the blood—an extraordinary fact quite inexplicable. 3. That the density of the serum was notably lower than the normal figure. 4. That the quantity of globules was always less than normal, and was found very much diminished in the case corresponding to the lowest density of the blood. 5. That the *fibrine*, contrary to received ideas, *was not diminished in any of the cases*. In two cases it offered the normal proportions (2·2), while in the three others it was sensibly augmented, viz., 3, 3·6, and 4·1. It appeared to be endowed with all its ordinary physiological properties. 6. That the organic matters of the serum, of which *albumen* constitutes the larger portion, had undergone a notable diminution, while the water existed in a considerable proportion. 7. That in no case were the inorganic matters superabundant, and nothing proved an excess of alkalies, which sometimes authors have declared to be the case in the blood of the scorbutic."

Is it not remarkable thus to see the most rational previsions entirely overturned? Theory declared that in scorbutus the quantity of fibrine was diminished, whence arose a defective plasticity, the cause of the characteristic hemorrhages. It added that such diminution of fibrine might be the sole change, without necessitating that of the other organic elements of the blood. But the exact reverse of this has come to pass. The *globules* and *albumen*, which should have remained uninfluenced, are found to descend much below the physiological mean; while the *fibrine* exhibits an opposite tendency, so as to approach it to the condition observed

in inflammations. Since the above analyses have been made, M. Andral has himself made another, and found the fibrine as high as 4·5; and M. Prus states that, he has frequently observed, at the Salpêtrière, facts analogous to these now brought forward. On the other hand, is it not interesting to see so large a diminution of *albumen* without any dropsy resulting, save a little œdema in the neighbourhood of much ecchymosis? Is there not here something which materially interests the theory of the production of dropsy by a diminution of the albumen of the blood?

But it will be said, do you pretend by these few cases to invalidate all the descriptions of the state of the blood in scorbutus handed down to us by the old writers? By no means. Only we would draw different conclusions from them. In fact, if we consult the principal authors who have written upon scorbutus, it becomes evident that they have given this name to diseases of a different nature, to true typhus; or that they have not taken into account the intercurrent affections arising during an epidemic of scorbutus, as of those which result from a putrid infection produced by the crowding together of patients in too small a space, as on board a ship. The dissolved state of the blood occurring under these circumstances would be easily explained.

And even supposing that in the great and destructive epidemics of scorbutus, the blood, deprived of fibrine, lost its power of coagulation, does it follow that this should always be the case? Is the quantity of fibrine constantly diminished in typhoid fever? To arrive at a knowledge of a disease, is it not necessary to study it in its most simple form, and to disengage it as much as possible from the complications which change its essential characters? It is precisely because the scorbutus we have observed presented itself in a simple but characteristic form, that the results we have adduced have an undeniable importance. They are neither numerous or conclusive enough to serve as a basis for any particular doctrine. They have only a negative value as tending to cast doubt on the doctrine of scorbutus prevailing in our time. They demonstrate the necessity of new researches, directed in other manners and by other proceedings, and undertaken upon a vast scale. Lastly, they confirm the utility of bearing in mind the maxim which Lind called the attention of the physicians of his time to—*Chymia egregia ancilla medicinæ; non alia pejor domina.*

Dr. Fauvel supplies a minute medical history of the cases observed by him, in proof of their being examples of genuine scorbutus: but to this we need very briefly refer. It showed itself chiefly in persons advanced in age, the youngest being 69 and three more than 80. They were all previously in good health, and fed upon substantial food. Among the principal symptoms observed was—(1). A *yellowish colouration of the entire skin, quite sui generis*, most comparable to the light yellow tinge which succeeds to ecchymosis. It affected especially the face, and extended to the conjunctivæ; but the urine giving no traces of colouring matter proved it was not icterus, which it so much resembled. This colour diminished and disappeared in proportion as the case proceeded on to recovery. (2). The *hemorrhagic spots* offered very different characters even upon the same subject, varying from mere red points to true purpural petechiæ. The most important variety was a true scorbutic hemorrhage, consisting of large ecchymoses or infiltrations into or below the subcutaneous cellular tissue of the lower extremities—occasionally constituting quite projecting tumefactions. Great pains frequently accompanied these effusions; and indurated œdematous infiltrations of the limb, together with pain and tenderness of the joints, were sometimes found. (3.) The *changes of the gums* were quite peculiar, not consisting in a general tumefaction and softening of their tissue as seen in some stomatites; but of fungous vegetations developed around the neck of each tooth, and being therefore only numerous in proportion to the number of teeth which remained. They were soft, and bled easily. Mastication was difficult, and the mouth exhaled a very fetid odour. (4). The *prostration of strength* of both body and mind was remarkable; although the tendency to syncope, mentioned by Lind, was not remarked—the patients, however, retaining the recumbent posture.

The *treatment* employed consisted in the use of a tisane acidulated with lemon, a mixture containing tannin and antiscorbutic syrup, linseed cataplasms watered with a decoction of bark, as substantial a regimen as the state of the mastication

admitted of, composed of rich soups, roast meat, and as large a proportion of green vegetables as possible. In the course of treatment the juice of antiscorbutic herbs was substituted with great advantage for the tannin. Of nine patients, four were completely cured in an average period of two months, four still continued under treatment, and one died.—*Med.-Chir. Rev.*, Oct. 1847, from *Archives Générales de Méd.*, July, 1847.

—

36. *On Scurvy.* By. M. Andral.—Subsequent to the result of MM. Becquerel and Rodier's investigations (see page 236) being communicated to the French Academy, M. Andral read an account of a new analysis which he had at the same time made of the blood drawn from a well-marked case of scorbutus under his own care at La Charité. The following is the substance of his important remarks.

"I expected to find it diffluent and dissolved, but to my great astonishment it was not só. It consisted, in fact, of a small dense coagulum as resistent as that of phlegmasiæ, and covered by a well-marked buffy coat, and was suspended in a large quantity of serum. In the 1000 parts it gave the following proportions:

Fibrine - - -	4·420
Globules - - -	44·400
Solid matters of the serum	76·554
Water - - - -	874·626
	1000·000

"This blood in its composition resembled that of chlorotic patients by the diminution of its globules, and the large quantity of water, although the patient presented other symptoms than those of mere chlorosis. As to the fibrine, instead of being less than, it exceeded, the physiological mean. This is quite a different result from that I obtained in the other published case, in which the globules were in nearly their normal proportion, and the fibrine was in very small quantity. So, too, I found very little (about 1 per 1000) in a patient attacked with purpura hemorrhagica.

"The fact which I have narrated, and which is confirmatory of those recently laid before the Academy, proves that the symptoms ordinarily characterizing scorbutus may be produced without being neces-arily accompanied by a diminution of fibrine. It is not then in such diminution we can place the proximate cause of scorbutus; and it is not by it even we can hope to explain several of its symptoms, especially its characteristic hemorrhages. In this respect, as well as in several others, we may perhaps compare scorbutus with *typhoid fever.* In the latter, in fact, the lowering the proportion of fibrine is often met with, but it is not necessary for the existence of the disease. Observation only authorizes us to state that the diminution is considerable in proportion as the dynamic form of the disease is well pronounced. The same thing takes place in the eruptive fevers; so that, in these different cases, the diminution of fibrine cannot be considered as one of the necessary elements of the disease, but only as one of the more or less frequently occurring effects of the cause which has produced it, and which exerts its influence alike upon the vital forces which it tends to depress, upon the nervous system which it throws into great perturbation, and upon the blood in which it tends to produce an alteration, the reverse of that observed in phlegmasiæ. The same thing appears to me to take place in scorbutus. Like typhoid fever, it may become developed without the blood having previously lost its fibrine, and therefore a diminution of this is neither a necessary and constant occurrence, but only an effect, a result of prior morbid modifications, a result which is produced more or less frequently according to the severity, duration, &c., of the disease.

"Are we to refer the hemorrhages of scorbutus to this diminution of fibrine as their cause? There can be no doubt that hemorrhages which, like those of scorbutus, are multiplied and repeated at a great many points of the economy, are especially seen in those cases in which the blood itself has become more poor in fibrine than in the physiological state. But these are two facts which it seems to me are only coincident in their relation: both doubtless being most frequently produced under the influence of a common cause: both are but manifestations

of that cause, but the one does not seem to me to engender the other. The case I have related presents an example of remarkable hemorrhages without any such diminution. Moreover, is it so easy to understand theoretically why a diminution of the quantity of fibrine should lead to a flow of this fluid from its vessels? Is the diameter of the globules diminished, so that they can more easily traverse the vascular parietes? Are we to admit that this passage may be favoured by an antecedent hypnæmia, when, after the violent distension of the vessels produced by inflammatory congestion such effect is not produced, and the globules do not leave their vessels but when these have been torn? This opinion, reproduced in our times, and which I myself have maintained, making the hemorrhages of scorbutus and pernicious fevers dependent upon a dissolved state of the blood, arose at a period when it was believed that this took place from the destruction of its globules; but such destruction, supposed by Huxham and so many others, is a pure hypothesis. Many a time, in cases in which the blood presented different degrees of this dissolved state, have I examined it with the microscope; and I have constantly found its globules with their ordinary appearance, and perfectly untouched. So, too, the globules in the blood from the hemorrhages possess all their physiological characters. I repeat, then, it is not easy to understand how the simple diminution of the fibrine should render their issue from the vessels more easy. In considering the augmented portion of fibrine observed in this patient, we must bear in mind, however, that when the bleeding was practised there were symptoms of acute disease of the respiratory organs, with much febrile reaction, and I believe it is to this circumstance we ought to attribute so large a proportion of fibrine. Some days after this bleeding had been practised, and probably in consequence of it, we could discover no traces of inflammatory action. Although the blood, at least three weeks prior to death, had not lost its fibrine, the spleen, nevertheless, was none the less soft and reduced to a pulp; so that we here see a change which, although generally coinciding with a dissolved state of the blood, may yet exist without it. The highly congested lungs, containing here and there apoplectic kernels, contrasted by their dark colour with the extreme paleness of the liver and kidneys."—*Med.-Chir. Rev.*, Oct. 1847, from *L'Union Médicale*, No. 78.

—

37. *On the Sedative Effects of Astringent Substances.* By Dr. SELLER.—The author set out with remarking, that the property of restraining excessive nervous susceptibility, of allaying morbid sensations and irregular vital acts, possessed in a high degree by narcotics, belonged to some substances besides, as to preparations of lead, fixed alkalies and alkaline carbonates, to some other remedies, usually placed among refrigerants, besides salts of lead, and, as generally acknowledged, to some substances in the order of astringents. It appeared to him, however, that this property is so universal among astringents, that it may be suspected to belong to them in virtue of their astringency. He then made some preliminary observations on the meaning of the term sedative, remarking, that this term, in its most general sense, might require extension rather than limitation; for while it was commonly employed, merely in reference to the mitigation of anormal states of the nervous system, of which the patient is conscious, it is highly probable that there are remedies capable of restraining the transmission, by nerves, of impressions—of which the patient is not immediately conscious—but which, nevertheless, may have the effect of producing the most serious morbid consequences. And thence he inferred it to be not unlikely, that many of our so-called specifics and alteratives act in this manner—silently controlling agencies which, left to operate with their natural force, neutralize the sanative efforts made by the constitution to throw off the disease. After illustrating this idea, he proceeded to review the ordinary sedative property possessed by such chemical astringents as lime water, sulphuric acid, alum, and sulphate of zinc, and by such vegetable astringents as catechu, kino, logwood, galls, rhatany, and uva ursi, with the purpose of bringing the facts recorded in the history of these substances to bear on his general conclusion, that astringent substances are sedative in virtue of their astringency.—*Proceedings of Medico-Chirurg. Soc. of Edinburgh*, in *Monthly Jour. Med. Sci.*, August 1846.

SURGICAL PATHOLOGY AND THERAPEUTICS AND OPERATIVE SURGERY.

38. *On the Use of Nitrate of Silver in the Cure of Erysipelas.*—Mr. Higginbottom has found that, if the nitrate of silver be applied *early*, it subdues local inflammation and irritation, if we employ, at the same time, the most efficient means for regulating the digestive organs.

At an early period of his practice, in slight cases of erysipelas, he used constitutional remedies alone, hoping that the inflammation would have been arrested; but, having been so often disappointed, he now uses both local and constitutional remedies simultaneously, and especially the nitrate of silver. Even in mild cases of erysipelas, in which he did not apply the nitrate of silver, he found the disease very long in duration, and observed that the patients had sometimes numerous small abscesses requiring the use of the lancet, which might have been prevented altogether by the early application of the nitrate of silver.

The objections he formerly entertained to the very early application of the nitrate of silver, were the pain and inconvenience attending the discoloration of the part on which it is applied, which remains for a week or more; but these objections are trifling compared with the continued severity of the disease, if permitted to run its usual course, particularly on the head, in which there is also great danger of inflammation of the membranes of the brain and of serous effusion. He has found that, when the inflammation has been subdued by an early use of the nitrate of silver, the constitutional symptoms were immediately relieved; the constitutional disturbance is directly aggravated by the least increase of local inflammation, and in a few hours, after a decided application of the nitrate of silver, the inflammation is arrested and gradually subdued, and with it the constitutional symptoms cease.

Even in idiopathic erysipelas, there is no period of the disease when he would not apply the nitrate of silver. He has never in any cases seen metastasis, or any other bad effect from the use of this important remedy.

When it is necessary to apply the nitrate of silver over an extensive surface, as in erysipelas, he has for some years used the concentrated solution in the manner proposed by Mr. John Gooch, surgeon R. N., in a paper published in the *Lancet* of September 15th, 1832, entitled "Practical Remarks on Erysipelas as it appeared on board his Majesty's ship *Prince Regent*." The strength of the solution is not given in this paper; he prescribes it in the following manner: ℞.—Argenti nitratis, scr. iv; Acidi nitrici, gtt. vj; Aquæ destillatæ, dr. iv.

In erysipelas of the face, when it is spreading on the forehead, or at all on the scalp, the head should be shaved as early as possible, in order that we may trace the extent of the inflammation on the scalp, which often can only be detected by pain, or by an œdema being felt on pressure with the finger. The affected part should be well washed with soap and water to remove any oily substance from the skin, and afterwards with pure water, to wash away any particle of soap remaining. The concentrated solution may then be applied several times on the inflamed part, and for two or three inches beyond the inflamed margin on the healthy skin. It requires to be applied very freely all over the scalp, where it scarcely or never produces vesication.

In about twelve hours it will be seen if the solution has been well applied. If any inflamed spot be unaffected by it, it must be immediately re-applied to it. Sometimes even after the most decided application of the nitrate of silver the inflammation may spread, but it is then generally much less severe, and it is eventually checked by the repeated application of this remedy. He has in some cases of traumatic erysipelas, found the inflammation spread more severely and more rapidly than in the idiopathic, but by the free repeated application of the nitrate of silver, it has at length been subdued.

The great obstacle to the general and free use of the nitrate of silver, even at the present day, appears to arise from the impression on the minds of many surgeons that it is a caustic—a destructive agent. If they could be divested of that idea, and use it as freely as they would a common blister of cantharides, their fears would soon subside, from repeatedly observing the safety of the application,

and also its beneficial effects. Mr. H. considers it a safer remedy than cantharides, as it may be applied freely over a surface, even where very active inflammation exists, or where there is an extensive surface denuded of its cuticle. This remedy has also the advantage of not affecting the bladder, or producing strangury.

The nitrate of silver is not a caustic in any sense of the word. It subdues inflammation, and induces resolution and the healing process. It preserves, and does not destroy, the part to which it is applied. If we compare a caustic, as the hydrate of potassa, with the nitrate of silver, we find that the hydrate of potassa destroys and induces a slough and the ulcerative process; but if we touch a part with the nitrate of silver, the eschar remains for a time, and then falls off, leaving the subjacent parts healed.

If an ulcerated surface secreting pus be touched by the nitrate of silver, the succeeding discharge is immediately converted into lymph: it is the property of the hydrate of potassa, on the contrary, to induce not only ulceration but suppuration. In short, the peculiar properties of the nitrate of silver have long been kept unknown to us by the designation of lunar caustic, affording the most striking instance of the influence of a term, or of a classification, upon the human mind. The nitrate of silver and the hydrate of potassa (as indeed all caustics) are as the poles to each other; the first preserves, the second destroys; the first induces cicatrization, the second ulceration.—*Read at the Prov. Med. and Surg. Assoc.*, Aug. 4th, 1847, from *Month. Journ. of Med. Science*, Oct. 1847.

—

39. *Axillary Aneurism—Ligature of Subclavian Artery—cure.* By James Syme, Esq. (*Month. Journ. of Med. Science*, Oct. 1847.)—The subject of this case was a gentleman, 34 years of age, who applied to Mr. Syme, July 25th, with an axillary aneurism of the right side. The aneurism was of large size, filling the axilla, and pressing forward the pectoral muscle, so as to be distinctly perceptible through the clothes. The patient stated, that about sixteen years ago he had fallen down a stair, and, by an involuntary effort to save himself, had seized the railing with his right hand, and consequently sustained a very severe wrench of the limb. With exception of some pain, and the ordinary uneasiness attending such an injury, he had not afterwards suffered any noticeable inconvenience further than an occasional difference of temperature in the hands, until about ten months ago, when he began to suffer from pain in the little and ring fingers, which gradually became almost constant and extremely distressing. More lately, the axillary tumour had attracted attention; and on the 29th, with the assistance of Drs. Duncan and Mackenzie, Mr. S. tied the subclavian artery, where it emerges from the scalenus anticus, by a single silk ligature, drawn with all the tightness in his power. No inconvenience whatever was experienced—the ligature separated on the fifteenth day, and the patient at the end of another fortnight returned home, perfectly free from pain, and with hardly any perceptible remnant of the tumour.

In performing the operation, Mr. S. made an incision along the clavicle, so as to extend over the edges of the sterno-mastoid and trapezius muscles, and another from the centre of this upwards, parallel with the edge of the latter muscle. The dissection was conducted entirely by the knife and forceps. The needle was passed under the artery, with its convexity upwards, and the ligature was tied by the unaided effort of the fingers. It has been advised to pass the needle with its convexity downwards, or towards the clavicle, with a view to protect the vein from injury. But this vessel is not at all in the way, while the cervical nerves are so situated in regard to the artery, as in general to render it nearly, if not quite, impossible to convey the ligature from below upwards. It has also been advised to employ the assistance of some mechanical contrivance for tightening the knot. But Mr. S. feels persuaded that the thread will always be within reach of the fingers, and may be more safely tied by them simply, than with the intervention of any instrument.

—

40. *Ligature of the Common Iliac Artery for Inguinal Aneurism.* By Wm. Lyon, Esq., Surgeon to Royal Infirmary, Glasgow. (*Month. Journ. of Med. Sci.*, Oct. 1847. —The subject of this case was a man 53 years of age, tall, corpulent, relaxed, and in general, enjoying good health. The tumour was of the size of an expanded and arched hand, extending for three inches below, and rather further above Poupart's

ligament, slightly depressed in centre by ligament, nearly of equal breadth as length, and throbbing violently.

June 3d a ligature was applied about half an inch above the origin of internal iliac. For the first twenty-four hours the patient was, in every respect, in a favourable condition; after which sinking commenced, and without pain, or any appreciable lesion, he rapidly lost strength, retaining his mental powers to the last. Upon post-mortem examination, no vestiges of inflammation of any part of peritoneum were found, unless a small quantity of milky serum in track of wound be so reckoned.

—

41. *Wound of the Internal Carotid Artery, and Division of the Par Vagum, in which the common Carotid Artery was tied.* By S. W. Fearn, Esq.—(*Prov. Med. and Surg. Journ.*, Sept. 8, 1847.)—The subject of this case was a female (Mrs. Osborn) 68 years of age, spare habit and nervous temperament, who was attacked at 5 P. M., Feb. 2d, 1847, by a man armed with a pruning knife, and received three severe stabs on the left side of the neck, and some others of a more trifling nature elsewhere. When seen by Mr. F., about three-quarters of an hour after the injury, she was in a state of extreme exhaustion. There was a deep wound about three inches in length immediately behind the angle of the jaw, extending perpendicularly downwards; another, a jagged wound, over the transverse processes of several of the middle cervical vertebræ, and a deep gaping wound midway between the occipital spinous process, and the mastoid process of the temporal bone; the other wounds being slight, need not be particularly described. There was a slight oozing of blood, but Mr. F. was unable to discover that any large arterial trunk had been injured. After waiting some time the wounds were dressed, and brandy and water were freely administered, as far as the difficulty in swallowing would permit.

Two hours after the injury, the patient, in getting out of bed to the night-chair, was attacked with an alarming hemorrhage, which, on removing the dressings, was found to proceed from the wound behind the angle of the jaw; the hemorrhage was arterial, and came forth in a stream as large as a swan-quill. Convinced that some large arterial trunk must be wounded, and most likely the internal carotid, Mr. F., in consultation, determined to place a ligature on the trunk of the common carotid. This he accordingly did, and the hemorrhage was at once arrested. The ligature came away on the 20th day, and the patient survived until the 22d of April, 79 days. During the whole of this period she had distressing difficulty of swallowing, suffered from suffocative cough, excited and very variable state of the circulation; extreme exhaustion, feebleness and emaciation came on, in which condition she sunk at the period mentioned. The following were the *post-mortem* appearances:

"Body emaciated; heart loaded with fat; lungs did not collapse on opening the chest; the left lung a good deal congested posteriorly, and the right also congested posteriorly, but to a less extent; there was much frothy muco-purulent matter in the larger bronchial tubes, and the bronchial membrane was much injected. In the neck, at the site of the ligature, the cellular membrane was condensed and firmly adherent to the adjoining structures; the point of ligation was well marked, and the artery was filled with a dense brownish-coloured fibrinous coagulum, which commenced about half an inch from the origin of the vessel; the artery was considerably diminished in size; above the ligature, and especially at the bifurcation, the vessel was contracted and hardened, and contained the same kind of fibrinous coagulum, but in a proportionately less quantity; in this situation, too, there was a very minute abscess in the coats of the artery; the posterior face of the internal carotid, immediately above the point where it is given off from the common trunk, presented a well-marked appearance of the wound which had furnished the alarming hemorrhage at the time of the injury, and in the same situation the *par vagum* was found to have been divided. (I have since found, in examining the parts after they had been some time in spirit, that the reddened line which had indicated the point of injury of the vessel, at the time of the dissection very distinctly, has disappeared from the maceration. The edges of the wound had closely united, and there is no trace of the wound on the internal coat of the artery. This condition of the parts is similar to what is stated to have

occurred in the experiments of Béclard, and the *possibility* of which is likewise affirmed by Chelius. It should be stated that the wound of the vessel was *oblique* or *diagonal*, and that it had a length of about two lines. The vessel in the situation of the injury is perfectly permeable, and there is no appearance whatever of the 'plug of plastic matter' observed in the experiments of Saviard, Petit, and Scarpa.) (Vide '*Chelius' Surgery*, by South,' vol. i. p. 298.) The lower extremity of the divided nerve was shrunk and atrophied, and there was a slight enlargement (a neuroma) at the extremity of the upper divided end; there was no observable indication of wound, either of the pharynx or glottis; the subclavian artery of the left side, and the innominata with its chief and lesser branches, appeared to me to be of unusually large size. The viscera of the abdomen, and the contents of the cranium, were not examined, the friends of the patient being unwilling that any further investigation than of the parts immediately implicated should be made."

"The following," Mr. Fearn remarks, "are the chief points of interest in the foregoing case:—1st. The extreme rarity of the occurrence of a case of wound of a vessel of so much importance as the internal carotid, in which there is any opportunity of rendering surgical aid. 2d. The difficult deglutition and imperfect closure of the glottis in the act of swallowing. 3d. The excited and variable state of the circulation; and lastly, the engorged condition of the pulmonary vessels, and the consequent suffocative cough and abundant bronchial secretion.

"With regard to the first point I may state that I have been unable to meet with more than one recorded instance in which the internal carotid was *proved* to have been injured and in which the common carotid was tied. The case is related in Mr. Cooper's admirable Dictionary, and was under the care of Andersch; the common carotid was tied after a wound of the internal carotid, and the patient died on the eighth day. In the present case life was prolonged beyond the eleventh week, and looking to the state of the parts as revealed by the *post-mortem* examination, we may fairly be permitted to regard it, in a surgical point of view, as successful.

"Secondly, the difficulty of swallowing and imperfect closure of the glottis, which in the first instance were, perhaps very naturally, attributed to some injury of the pharynx and upper part of the respiratory tube, are beautifully explained by the fact of the *par vagum* having been divided. As one effect of this injury must be a paralysis of the recurrent laryngeal nerve, (a motor nerve,) and as it supplies, as I need hardly remind you, the inferior constrictor of the pharynx, and the crico and thyro-arytenoidei muscles, we are at no loss to understand the double embarrassment of the patient in the act of swallowing. Indeed so great was the distress occasioned, that at times it was almost impossible to prevail upon her to take even the small quantity of nutriment necessary to sustain life.

"The third and fourth points of interest,—namely, the irregular and hurried state of the circulation, and the difficult respiration, may properly be considered together. The irritation in the air-passages, and the abundant secretion and cough, arose probably from congestion of the pulmonary vessels, which I imagine to be caused by the sudden closure of one important outlet from the left side of the heart. It would naturally follow, if the free egress of the blood from the left ventricles were prevented, that the pulmonary veins must become engorged, and indeed the whole thoracic circulation must be obstructed—a condition which would give rise to great irritation of the pulmonary organs, and the abundant mucous secretion present in this case. A precisely similar state of things occurred in my patient, Mary Scattergood, upon whom I operated for aneurism of the arteria innominata, both after the ligature of the common carotid, and subsequently after tying the subclavian artery. I find, too, from an excellent paper by Professor Miller, of Edinburgh, in the *London and Edinburgh Monthly Journal of Medical Science*, 1842, that in the majority of the fatal cases of operation on the large arteries of the neck, he considers death is attributable to inflammation of the lungs; and my friend, Professor Fergusson, of King's College, seems to incline to the same opinion. Of course, under common circumstances, our sheet anchor in combating such symptoms would be repeated blood-lettings, and the administration of opium; but in the case of Mrs. Osborn, there were such frequent and alarming attacks of syncope, and the utter prostration and exhaustion from the

ligament, slightly depressed in centre by ligament, nearly of equal breadth as length, and throbbing violently.

June 3d a ligature was applied about half an inch above the origin of internal iliac. For the first twenty-four hours the patient was, in every respect, in a favourable condition; after which sinking commenced, and without pain, or any appreciable lesion, he rapidly lost strength, retaining his mental powers to the last. Upon post-mortem examination, no vestiges of inflammation of any part of peritoneum were found, unless a small quantity of milky serum in track of wound be so reckoned.

—

41. *Wound of the Internal Carotid Artery, and Division of the Par Vagum, in which the common Carotid Artery was tied.* By S. W. Fearn, Esq.—(*Prov. Med. and Surg. Journ.*, Sept. 8, 1847.)—The subject of this case was a female (Mrs. Osborn) 68 years of age, spare habit and nervous temperament, who was attacked at 5 P. M., Feb. 2d, 1847, by a man armed with a pruning knife, and received three severe stabs on the left side of the neck, and some others of a more trifling nature elsewhere. When seen by Mr. F., about three-quarters of an hour after the injury, she was in a state of extreme exhaustion. There was a deep wound about three inches in length immediately behind the angle of the jaw, extending perpendicularly downwards; another, a jagged wound, over the transverse processes of several of the middle cervical vertebræ, and a deep gaping wound midway between the occipital spinous process, and the mastoid process of the temporal bone; the other wounds being slight, need not be particularly described. There was a slight oozing of blood, but Mr. F. was unable to discover that any large arterial trunk had been injured. After waiting some time the wounds were dressed, and brandy and water were freely administered, as far as the difficulty in swallowing would permit.

Two hours after the injury, the patient, in getting out of bed to the night-chair, was attacked with an alarming hemorrhage, which, on removing the dressings, was found to proceed from the wound behind the angle of the jaw; the hemorrhage was arterial, and came forth in a stream as large as a swan-quill. Convinced that some large arterial trunk must be wounded, and most likely the internal carotid, Mr. F., in consultation, determined to place a ligature on the trunk of the common carotid. This he accordingly did, and the hemorrhage was at once arrested. The ligature came away on the 20th day, and the patient survived until the 22d of April, 79 days. During the whole of this period she had distressing difficulty of swallowing, suffered from suffocative cough, excited and very variable state of the circulation; extreme exhaustion, feebleness and emaciation came on, in which condition she sunk at the period mentioned. The following were the *post-mortem* appearances:

"Body emaciated; heart loaded with fat; lungs did not collapse on opening the chest; the left lung a good deal congested posteriorly, and the right also congested posteriorly, but to a less extent; there was much frothy muco-purulent matter in the larger bronchial tubes, and the bronchial membrane was much injected. In the neck, at the site of the ligature, the cellular membrane was condensed and firmly adherent to the adjoining structures; the point of ligation was well marked, and the artery was filled with a dense brownish-coloured fibrinous coagulum, which commenced about half an inch from the origin of the vessel; the artery was considerably diminished in size; above the ligature, and especially at the bifurcation, the vessel was contracted and hardened, and contained the same kind of fibrinous coagulum, but in a proportionately less quantity; in this situation, too, there was a very minute abscess in the coats of the artery; the posterior face of the internal carotid, immediately above the point where it is given off from the common trunk, presented a well-marked appearance of the wound which had furnished the alarming hemorrhage at the time of the injury, and in the same situation the *par vagum* was found to have been divided. (I have since found, in examining the parts after they had been some time in spirit, that the reddened line which had indicated the point of injury of the vessel, at the time of the dissection very distinctly, has disappeared from the maceration. The edges of the wound had closely united, and there is no trace of the wound on the internal coat of the artery. This condition of the parts is similar to what is stated to have

occurred in the experiments of Béclard, and the *possibility* of which is likewise affirmed by Chelius. It should be stated that the wound of the vessel was *oblique* or *diagonal*, and that it had a length of about two lines. The vessel in the situation of the injury is perfectly permeable, and there is no appearance whatever of the 'plug of plastic matter' observed in the experiments of Saviard, Petit, and Scarpa.) (Vide '*Chelius' Surgery*, by South,' vol. i. p. 298.) The lower extremity of the divided nerve was shrunk and atrophied, and there was a slight enlargement (a neuroma) at the extremity of the upper divided end; there was no observable indication of wound, either of the pharynx or glottis; the subclavian artery of the left side, and the innominata with its chief and lesser branches, appeared to me to be of unusually large size. The viscera of the abdomen, and the contents of the cranium, were not examined, the friends of the patient being unwilling that any further investigation than of the parts immediately implicated should be made."

"The following," Mr. Fearn remarks, "are the chief points of interest in the foregoing case:—1st. The extreme rarity of the occurrence of a case of wound of a vessel of so much importance as the internal carotid, in which there is any opportunity of rendering surgical aid. 2d. The difficult deglutition and imperfect closure of the glottis in the act of swallowing. 3d. The excited and variable state of the circulation; and lastly, the engorged condition of the pulmonary vessels, and the consequent suffocative cough and abundant bronchial secretion.

"With regard to the first point I may state that I have been unable to meet with more than one recorded instance in which the internal carotid was *proved* to have been injured and in which the common carotid was tied. The case is related in Mr. Cooper's admirable Dictionary, and was under the care of Andersch; the common carotid was tied after a wound of the internal carotid, and the patient died on the eighth day. In the present case life was prolonged beyond the eleventh week, and looking to the state of the parts as revealed by the *post-mortem* examination, we may fairly be permitted to regard it, in a surgical point of view, as successful.

"Secondly, the difficulty of swallowing and imperfect closure of the glottis, which in the first instance were, perhaps very naturally, attributed to some injury of the pharynx and upper part of the respiratory tube, are beautifully explained by the fact of the *par vagum* having been divided. As one effect of this injury must be a paralysis of the recurrent laryngeal nerve, (a motor nerve,) and as it supplies, as I need hardly remind you, the inferior constrictor of the pharynx, and the crico and thyro-arytenoidei muscles, we are at no loss to understand the double embarrassment of the patient in the act of swallowing. Indeed so great was the distress occasioned, that at times it was almost impossible to prevail upon her to take even the small quantity of nutriment necessary to sustain life.

"The third and fourth points of interest,—namely, the irregular and hurried state of the circulation, and the difficult respiration, may properly be considered together. The irritation in the air-passages, and the abundant secretion and cough, arose probably from congestion of the pulmonary vessels, which I imagine to be caused by the sudden closure of one important outlet from the left side of the heart. It would naturally follow, if the free egress of the blood from the left ventricles were prevented, that the pulmonary veins must become engorged, and indeed the whole thoracic circulation must be obstructed—a condition which would give rise to great irritation of the pulmonary organs, and the abundant mucous secretion present in this case. A precisely similar state of things occurred in my patient, Mary Scattergood, upon whom I operated for aneurism of the arteria innominata, both after the ligature of the common carotid, and subsequently after tying the subclavian artery. I find, too, from an excellent paper by Professor Miller, of Edinburgh, in the *London and Edinburgh Monthly Journal of Medical Science*, 1842, that in the majority of the fatal cases of operation on the large arteries of the neck, he considers death is attributable to inflammation of the lungs; and my friend, Professor Fergusson, of King's College, seems to incline to the same opinion. Of course, under common circumstances, our sheet anchor in combating such symptoms would be repeated blood-lettings, and the administration of opium; but in the case of Mrs. Osborn, there were such frequent and alarming attacks of syncope, and the utter prostration and exhaustion from the

loss of blood at the time of the injury were such, that we were repeatedly driven to the employment of stimulants in large quantity, when other symptoms seemed urgently to demand an antiphlogistic mode of treatment. In short, the advanced age of the patient, and the absolutely drained condition of the vascular system, in spite of the local engorgement, forbade the use of any other remedies than opiates, expectorants, and counter-irritants, due attention being at all times had to the state of the primæ viæ, and the persevering and almost hourly administration of nutriment."

—

42. *Singular Case of Dissecting Aneurism.* By Prof. PIRRIE, of Aberdeen.—In the body of a man, about fifty years of age, who, during life, had not been supposed to be the subject of any disease, and who died very suddenly, and before any medical man had an opportunity of seeing him, I met with a singular variety of dissecting aneurism. In the arch of the aorta, about three-fourths of an inch to the left side of the origin of the left subclavian artery, there was a rent of the inner and middle coats. From this rent to near the origin of the aorta, on the cardiac side, and for upwards of an inch on the capillary side, the external coat was separated from the middle, and also around nearly two-thirds of the circumference of the artery.

From the aneurism thus formed there was an opening upwards of half an inch in diameter, through which it burst into the pulmonary artery—a little below the part where that vessel gives off its two branches. The aorta was affected with steatomatous deposit in many parts, and, however rare the occurrence, there were, beyond all doubt, patches of the same kind of degeneration in the pulmonary artery. There was also slight hypertrophy of the left side of the heart.

In almost all recorded examples of dissecting aneurism, the heart has been found affected with disease, more especially its left side. In some instances there has been dilatation, with hypertrophy; in others, dilatation with attenuation; and, in many, there have been evident signs of steatomatous and calcareous deposits in different parts of the vascular system. According to Rokitansky, dissecting aneurism sometimes commences by disease of the *middle* and *internal* coats. In that case the continuity of these coats becomes interrupted, and the separation of the external coat follows as a later event. In other instances, the first deviation from healthy condition is chronic inflammation of the *external* coat, which gives rise to separation of that coat, followed by rupture of the middle and internal coats. In the one class of cases, he considers that the rupture precedes; in the other, that it follows the separation.—*Month. Journ. Med. Sci.* Nov. 1847.

—

43. *Dislocation of the Pelvis.*—M. MURVILLE, in a memoir, presented to the French Academy of Medicine, on luxations of the pelvic bones, relates the two following very remarkable examples of this accident. The first was the case of an officer, who fell from a second-floor window, and lighted on the tubera ischii. The sacrum was displaced downwards by the weight of the body. On examination, the crests of the ilia were found to be almost touching the false ribs; the os coccygis, much shattered, projected considerably below. The patient complained of great pain in the sacro-iliac symphysis, with paralysis of the bladder and rectum, small pulse, and other signs of collapse. He was restored somewhat by stimulants, and when reaction was fully established, he was treated antiphlogistically, the displaced bones being maintained as motionless as possible. No attempt at reduction was considered advisable. This treatment was marvellously successful; not only did the patient survive, but the paralysis diminished, and in ten days the patient was able to walk with difficulty.

The second case is unique. An officer during a review was run away with, the horse at the same time plunging violently; in one of the plunges he was thrown considerably from his saddle, upon which he descended again with such force as to lacerate the left side of the pelvic arch, without injuring the skin. A second plunge of the animal added to the mischief, completely rupturing the ligaments of the symphysis pubis. When examined, a large inguinal hernia was discovered on the left side, and in the perineum a tumour projected as large as the fist, which could be pushed upwards into the pelvis. The symphysis pubis was separated to an extent which allowed the hand to be insinuated between the

ossa pubis. The hernia was reduced, and the bones kept in apposition by bandages, and in three months the patient was able to walk. M. Murville upon this case founded some remarks upon the feasibility of the operation of division of the symphysis in labour. In a discussion which ensued, M. Malgaigne doubted that it was a case of simple dislocation, thinking it probable that there was also fracture.—*Prov. Med. and Surg. Journ.*, Nov. 17th, 1847.

—

44. *Cauterization of Vesico-Vaginal Fistula with Creasote.* By Prof. Emmert of Bern.—A vesico-vaginal fistula, subsequent to artificial labour, having been treated with lapis infernalis seventeen times without any success, Emmert proceeded to remove the gangrenous scab produced by the last cauterization, after which he touched the fistular opening to a great extent by means of a pencil-brush immersed in creasote. The success was most surprising. The new scab was so firm, as to enable the patient to retain her urine the whole day, and to micturate without becoming moist. The detachment also occurred much later than after the application of other caustics, and when effected, the urine flowed in far less quantity from the somewhat diminished fistula. A second application of creasote, six days afterwards, induced a perfect cure of the fistula, and no urine has passed from it, during two months, which has since elapsed. A fortnight after the last cauterization, Emmert found the fistula perfectly cicatrized, its previous existence being marked only by a bluish-red streak, two lines in length. He therefore declares creasote to be the best application in such cases, the nitrate of silver being too feeble, and the concentrated acids too energetic in their action. *Monthly Journ. Med. Sci.*, Aug. 1847, from *Journ. für Chir. and Augenheilk*, 1847. *Heft* 4.

—

45. *Fatal Cases of Tetanus with Dissections.*—Dr. Lee read to the *Medico-Chirurgical Society of Edinburgh*, an account of two fatal cases of tetanus with dissections. The patients were two girls; twins. They had both been complaining for about two days, before unequivocal tetanic symptoms set in on the morning of the fifteenth of April, during which they suffered from some derangement of the bowels, with anorexia, white tongue, and a tendency to spasm. They had no diarrhœa. The urgent tetanic symptoms terminated fatally in the one case in from three to four hours, in the other, in eight or ten hours. Contagious fevers were prevalent at the time in the same common stair.

On dissection, both the brain and spinal cord were found to be quite healthy; and there was no evidence in either of inflammatory disease in any part of the body; but the intestinal glands exhibited a morbid state, which Dr. L. considered characteristic of entero-mesenteric fever in a very early stage, an opinion in which he stated he was joined by Professor Goodsir, who had also examined the intestines.

Dr. Lee concluded by reading an unpublished case of a similar kind, which occurred to Mr. Goodsir, in Anstruther, in 1834, when dothinenteritis was prevalent there. In this case the patient was a young man of nineteen years; the tetanic symptoms came on early on the seventh day, and death followed the same night. The only morbid appearance was that of the glands of the intestines, which characterizes the entero-mesenteric fever. Dr. L. exhibited preparations (injected and uninjected) of the intestines of the two children, which belong to the Anatomical Museum of the Edinburgh University, and mentioned that Professor Goodsir had informed him that specimens of the diseased gut in his case are preserved in Dr. Bennett's private collection.—*Monthly Journ. Med. Sci.*, Aug. 1847.

—

46. *Case of Enlargement of the Labial Glands.*—By W. R. Wilde, Surgeon to St. Mark's Hospital. The subject of this case was a man twenty years of age, light hair and fair complexion, who stated, that about two years ago, his upper lip, which had been previously of natural proportions, began to thicken and enlarge, particularly on its inferior and inner surfaces. That, since then, it has gradually increased in size; that it has not been attended with pain, but that, within the last few months, he has a feeling of stiffness and fulness in it, as well as some degree of irritation, dryness, and chapping, from the exposure of the mucous membrane to the influence of the atmosphere, &c. He says that he has never suffered from glandular

swelling, or any scrofulous disease; never had venereal; and has always enjoyed very good general health.

Upon examination, I found the lower lip totally unaffected, as well as the extreme angles of the upper; but all the rest of the red border of this lip was immensely thickened, and so much enlarged that, when the mouth was closed, it formed a large, projecting, red mass, not unlike a pair of ripe strawberries, the division between them being caused by the natural central sulcus of the lip. If these projections were allowed to remain unwiped for some time, a number of globules, of a clear fluid, formed upon the surface of the mucous membrane. If one of these was removed, and the eye was kept steadily fixed upon the surface beneath, another clear drop of fluid was seen to exude from a remarkably small aperture in the mucous membrane. Squeezing the lip between the fingers, if the pressure was continued for some minutes, likewise caused these drops to form like a dew on the surface of the membrane. The membrane itself was rather more vascular than usual: where the drops exuded, it was particularly smooth and polished, but towards the edge of the lip it had become thickened, covered over with adhesive crusts, and cracked in several places. The external surface of the lip was natural.

As the young man was very anxious to be relieved of this deformity, I removed it in the following manner. Assistants having commanded the coronary circulation, by holding the angles of the lip, as in the operation for the removal of cancer of this part, I made an incision, with a small, sharp scalpel, through the mucous membrane, parallel with, and about three-eighths of an inch from, the edge of the lip, and about two inches and a half in length. By another incision, through the membrane, upon the dental surface of the lip, which was everted for the purpose, I completely included, and dissected out the diseased mass, which, during the progress of the operation, I found to consist of a congeries of small globular bodies, nearly transparent, and about the size of advanced trout-spawn. There was scarcely any hemorrhage during the operation, and any granules of the disease which were cut across, or adhered to the surface of the wound, having been completely removed, the edges of the incision were accurately adjusted, and sewed together by a fine silk ligature, after the manner of the continued suture. Upon shutting the mouth, the deformity was found to have been completely removed, and the edges of the lip met as before the supervention of the disease. A few hours after a smart hemorrhage occurred from the surface of the wound, but it was checked by the use of tincture of matico, and occasional pressure, which the patient was able to effect for himself.

Having submitted the diseased mass to Professor Aldridge for examination, I received from him the following statement:

"I have examined the portions of the upper lip which you sent me, and can find nothing but the natural structures in a state of considerable hypertrophy. This increased nutrition appears not only to have affected the reticular cellular tissue of the glands, but likewise the fibrous structure of the cutis. You know how difficult it commonly is to perceive the fibrous structure of the true skin in the human subject; in this instance you will be able to perceive it with the naked eye, and still more remarkably with a lens. This gives to the touch a leathery sensation, and I can easily understand that, if the induration proceeded a little further, the part would acquire a scirrhous hardness.

"The great development of the labial glands, in this case, renders their structure very easily studied. By introducing a bristle into the gaping excretory orifice of one, you will find that it passes, by a narrow neck, into the gland, which is oval and about the size of a swan-shot. This gland is what Müller calls 'folliculus conglomeratus.' As might be expected, the blood-vessels proceeding to these glands are comparatively of a considerable size. I have counted thirty-six excretory orifices on the surface of one of the labial prominences that you removed, so that I can easily conceive the amount of projection which thirty-six of these glands, situated behind the mucous membrane, must have produced.

"You will find that, by carefully raising the cuticular covering of the surface, a tubular process of the epidermis can be drawn out of the excretory duct.

"The cellular tissue connecting the glands with each other is not indurated. Neither are the glands themselves indurated, though hypertrophied.

"You may question my employing the words 'skin,' and 'mucous membrane,' in this case, as synonymous; but in what consists their difference?"

The wound healed so kindly that the cicatrix could scarcely be perceived in a week's time. Nine months afterwards this man had no return of the disease.—*Dublin Quarterly Journ. Med. Sci.*, Aug. 1847.

—

47. *New Process for Removal of Toe Nail.* By M. Long, Surgeon to the Civil Hospital of Toulon.—M. Long, basing his idea on the mode of connection of the nail with the tissues; conceived it possible to tear away the nail by its root, by the aid of a simple spatula. Numerous experimental trials made on the dead subject confirmed him in this opinion, and he became able to remove the twenty nails in the short space of five minutes. Some of the nails on some bodies he found to tear, and a similar thing happens if the nail has been softened by topical applications.

The mode of proceeding M. Long finds to be of easy execution, quick, and but slightly painful, requiring no preparation, and but an ordinary iron spatula to effect it. The patient is seated on a chair, his foot being placed on the knee of the operator; the latter takes with his right hand the flattened end of the spatula, placing his thumb on the concave surface, his index and middle fingers on the convex, his two other fingers being disengaged. The spatula being thus held, the surgeon slowly separates the skin, which covers over the root of the nail. Having gained its posterior border, he executes a rapid movement from side to side, so as to bring the spatula to a very acute angle with the diseased toe. This being effected, the end of the spatula is found engaged beneath the nail, which still adheres by its sides and middle portion. Then, by pushing forward the instrument between the nail and subjacent tissues, the evulsion is accomplished without any further trouble.

Such is the operation adopted by M. Long, and he has always obtained good results from it. Among the patients operated on by him, one may be cited. He was a custom-house officer, whose nail of the right great toe was deeply buried at its sides in the flesh, to the depth of about two-fifths of an inch. The evulsion of the nail was practiced without pain, and without the loss of a drop of blood. The next day, morning, the patient returned to his employment, and fifteen days afterwards a new nail made its appearance. M. Long also performed the operation in a man suffering from traumatic onychia, and having his nail also grown over by the flesh; on the fourth day the patient got up, and on the twentieth left the hospital, a new nail beginning to appear.

The proceeding advocated by M. Long, seems adapted for all cases, in which the evulsion of the nail becomes necessary. The advantages it offers are—1st, the prospect of a complete and definite cure; 2d, the sparing the patient great suffering; 3d, its performance being attended with no loss of blood; 4th, and lastly, always allowing the tissues to reproduce a new nail.—*Lancet*, Sept. 18, from *Gaz. Méd. de Montpellier.*

—

48. *On Abscess of the Female Breast.*—By M. Velpeau.—"Subcutaneous inflammation of the breast proceeds much as an ordinary phlegmon. When the abscess is formed between the mamma and the chest, the swelling is considerable, the breast raised up, but after an incision the cure usually takes place rapidly. But when the phlegmasia invades the substance of the breast itself, it is rare to find only a single abscess produced. We sometimes see ten, twenty, forty or fifty manifesting themselves in succession. An instant's reflection will show that this result is a natural consequence of the anatomical disposition of the inflamed tissue. The glandular parenchyma consists of different lobules, each of which constitutes a little organ having its own function, and which may become heated and irritated under the influence of lactation. Each lobule does not attain at the same time the same degree of irritation. One first inflames, then suppurates, and constitutes a first abscess; a neighbouring lobule then becomes affected, and, in its turn, forms an abscess; and so it may go on with all of them until we have as many successive abscesses as there are lobules.

"This distinction of abscesses of the breast into at least three orders is of the highest importance; and if we do not adopt it, our ideas upon the subject will be but very vague, and devoid of all precision as respects prognosis and treatment. Parenchymatous abscesses may last four or six months, or a year even, according

to the rapidity of their succession and their number. The subcutaneous abscess lasts only as long as an ordinary phlegmon; and the submammary abscess has not the long duration of the parenchymatous one.

"Each of these has again its special treatment. We may endeavour to procure the resolution of *subcutaneous abscess*, and that by ordinary means: and, if suppuration occurs, we open it promptly, in order to avoid the burrowing of the pus among the tissues. *Sub-mammary phlegmon* should be treated especially by general measures, and leeches around the nipple. Topical applications are of little use, as they are separated from the centre of inflammation by the whole substance of the mammary gland. When an abscess is formed here, its prompt evacuation is desirable; but the perception of fluctuation is difficult, for the pus is surrounded by a large mass of tissues, and the thoracic parietes have not fixity enough to serve as a point of support. Nevertheless, you may recognize the existence of pus by the following characters. 1. An acute phlegmon rarely exists more than seven or eight days without suppuration taking place. 2. The breast is raised up like a sponge, and if we press upon it, it seems as if it were lying on a bladder full of fluid. 3. We find the breast surrounded by a kind of inflammatory œdema. Having recognized the pus, we should let it out promptly, or we expose ourselves to seeing it traverse the gland and form one of those abscesses I call *shirt-buttons*. These abscesses, moreover, have a mischievous influence upon the chest, and may lead to a purulent pleurisy. They may, too, penetrate into the cellular tissue for a distance, and give rise to a diffused phlegmon. The incision should be made into the most dependent part, the place of election being below and at the outer side of the nipple; but, in some cases, a projecting point of the abscess indicates the place at which the opening should be made. It is always advantageous to make the incision towards the circumference of the breast, because the gland itself is not touched, and its weight tends to expel the pus. The bistoury should be directed almost parallel with the thoracic parietes, so as to slide it in between these and the mamma. The danger of such incisions is not great, there being no large arteries to fear. *Parenchymatous phlegmon* requires an energetic and varied treatment—bleeding, purging, and the so-called anti-lactal medicines. When pus forms, which is almost always the case, topical applications and incisions seldom prevent the successive implication of the lobules. Nevertheless, there is some advantage derived from the prompt opening of the abscess, *if the patient agrees to it;* for you should recollect that, in practice, if you open one abscess and others form, she never fails attributing these to your proceedings. These details will, I think, suffice to show you how important it is to distinguish the different abscesses of the breast, and to explain to you the confusion which prevails in the minds of some surgeons, as regards their treatment."—*Med.-Chir. Rev.*, Oct., 1847, from *Gazette des Hôpitaux*, No. 89.

—

49 *Indurated Chancre of the Neck of the Uterus.*—Although most, if not all, surgeons now admit the possibility of the existence of chancres on the os and cervix uteri, yet few cases are on record; and the following abstract of one occurring in the practice of M. Cullerier, at the Hôpital de Lourcine, may prove interesting:—

A woman, seven months gone in pregnancy, entered the hospital, presenting, at the time of admission, a squamous and tubercular eruption over all the limbs. She stated that, up to the date of admission, she had been ill two months; that at the commencement of the disease, there appeared an ulcer on one of the external labia, and a profuse discharge from the vagina. On examination the morning after her admission, no trace of any ulceration was observed on the labia, but there was a vaginal discharge still going on. Examined by the speculum, the neck of the uterus was observed to be enlarged and flattened antero-posteriorly, so as to present a greater transverse diameter. Nearly two-thirds of the anterior lip were occupied by an ulcerated surface, of a grayish-yellow colour, and circumscribed by a circular margin of a deep-red colour. At first this ulcer was taken for a simple one, unconnected with syphilis; but at subsequent examinations, M. Cullerier was led to believe it to be analogous to an indurated syphilitic ulcer, in which opinion he was afterwards confirmed by the touch, which rendered sensible that peculiar resistance which is noticed on touching an indu-

rated chancre on the glans penis, and is readily distinguishable from the hardness of the substance of the cervix uteri. It ought, however, to be mentioned, that on inoculation being practised with the pus of the ulcer, the result has been negative.

M. Cullerier immediately placed the patient under mercurial treatment, notwithstanding her pregnant condition, being convinced that, among pregnant women suffering from syphilis, abortion is much more frequently brought about by the syphilis than by mercury when administered. Since the adoption of this general treatment, the cutaneous affection notably improved, and soon scarcely any trace was visible on the arms and hands.

Simple chancre, as we have remarked, is now acknowledged by nearly all as sometimes occurring on the cervix uteri. But M. Ph. Boyer denies this, as also, their existence within the vagina, saying, that his experience has proved to him, that neither mucous membranes are ever the seat of chancre, nor the vagina and cervix uteri. But observation certainly contradicts this statement of M. Boyer; for many have met with syphilitic ulcers on the cervix uteri, and have, by inoculation proved their nature; and M. Ricord has described and figured many such cases. Admitting, therefore, the existence of chancres on the neck of the womb, it may be asked—Can they ever become indurated? We have, *a priori*, no grounds to believe, that chancres occupying that position, should be exempt from induration, and observation, indeed, proves they are not. M. Baumès, in his treatise on venereal diseases, gives a case, with a plate, where, with constitutional syphilis, two indurated ulcers were seated on the cervix uteri without there being any other local manifestation of the disease; and M. Ricord has met with several parallel instances.

In M. Cullerier's case, it seems impossible to doubt the infection of the system from the indurated uterine chancre, nor can the negative result of the inoculation practised, be looked upon as contradicting this view; for, from the history of the patient, we may consider the ulcer to have passed that stage in its duration, when inoculation from it would be successful. We may suppose the ulcer, said to have existed on the external labia, to have been a chancre, although no trace of it existed on examination; but there remained no hardened cicatrix to intimate in the least that it had been an indurated one; if it had been, some indication would have been left, since the patient had been under no treatment. That indurated chancres on the cervix uteri have not been more frequently observed, seems owing to the difficulty of diagnosing them; for we are unable to seize them between the fingers, as in ordinary cases, and can only decide from their general hard feel and their appearance; and often, too, such chancres are no doubt mistaken for simple ulcers.

It is to the French surgeons, that we owe our knowledge of the existence of chancres within the vagina and on the neck of the uterus, and especially to M. Ricord, since the examinations necessary to detect them are not so much attended to in this country, and are not made with so great facility as in France. But the discovery of such centres of inoculation of the whole system by absorption, will be seen by all to be a matter of great moment, in order, as soon as possible, to bring about their cicatrization; and as such it should be attended to by British surgeons.—*Lancet*, Sept. 25th, 1847.

OPHTHALMOLOGY.

50. *Induction of Mercurial Salivation previous to operations for Cataract.*—M. Tavignot, in a communication read to the French Academy of Sciences, states:—

The beneficial influence exercised by salivation over acute inflammations of the iris and cornea is generally acknowledged. These affections being the usual cause of failure in operations for cataract, it occurred to me whether their development might not, to a certain point, be prevented by producing a commencement of salivation before proceeding to the operation. The idea seemed to be worthy an attentive examination, because salivation cannot be procured in an instant at the wish of the surgeon, and during the time it takes to establish it the inflamma-

tion may produce irremediable mischief; besides the inconveniences of a moderate salivation are but trifling in comparison to the dangers which are avoided in consequence.

"I have operated by depression on three patients thus prepared. One had a double cataract. In the second the operation was tedious, and followed by hemorrhage into both chambers of the eye. The third had an adherent cataract, complicated with a synochia anterior. The three cases were perfectly cured in a time varying from three to five weeks, without any serious inflammatory attack. Only one had a slight conjunctivitis. I will only add that the operation should be proceeded with on the first appearance of the precursors of salivation. The administration of the mercury is to be continued for two or three days that ptyalism may be at its height, at the period when iritis or corneitis usually occur; that is, from the third to the sixth day from the operation. That period past, there is not much danger of subsequent inflammation."

[M. Tavignot must be a very unfortunate operator if "iritis or corneitis usually occur" after his operations for cataract, or even "hemorrage into both chambers of the eye." We would respectfully submit whether it would not be advisable to adopt a different method of operating from that which he employs, rather than for the insufficient reason he assigns to subject patients to the evils of salivation. The fact, that mercury is often efficacious in arresting inflammation, affords slender reason for introducing it into the system, to prevent the occurrence of that accident. The mercurialization of a patient will not protect him from the sequence of a badly performed operation.]

---

51. *Syphilitic Ophthalmitis.*—Prof. PORTER in his interesting Clinical Lectures on Syphilis, (*Dublin Med. Press*, Ap. 7th, 1847,) thus describes this disease: "There is still another form in which syphilis may attack the eye, fortunately of far less frequent occurrence than that already described, for it is uniformly and certainly destructive, baffling every treatment, and progressing, without stay or interruption, to its melancholy termination: yet perhaps its infrequency is one reason why a surgeon should be aware of the possibility of its occurrence, more particularly as its commencement is as insidious as its end unfortunate. In this case there is, or appears to be, a universal inflammation of the organ, commencing in, and principally confined to the deeper structures, but eventually implicating all, and terminating in what Mr. Hewson, who first described the affection, has (perhaps erroneously) called an abscess. It begins by a deep, intense, and agonizing pain in the bottom of the eye, in the temple, and, perhaps, in one side of the head, which pain is aggravated at night, at which time the patient's sufferings are indescribable: the eye, notwithstanding, exhibiting little or no alteration to lead to a suspicion of the impending mischief. The next symptoms are an evident enlargement of the whole ball, with a fixed immobility of the iris, which appears pressed forwards into the anterior chamber, and whether contracted or dilated, is wholly insensible to the stimulus of light. Perhaps this might be termed the first stage of the disease, and, perhaps, also up to this period it might be possible to arrest its progress, and save the eye by a rapid exhibition of mercury, but the nature of the malady is not suspected, and the opportunity, if it really exists, is allowed to pass away. I say if it really exists, for I have some doubts on the subject, and my own experience can afford me no assistance: certainly when the disease has advanced so far as to be easily recognized, it admits of no remedy, and mercury, instead of mitigating the patient's sufferings, has seemed to me to enhance them considerably. Now, whether produced by the swelling and enlargement of the ball or not, I cannot say, but soon symptoms of conjunctival and sclerotic ophthalmia make their appearance—vascularity, increased secretion of tears, pain, and a sensation as if a grain of sand or other irritating substance had been admitted under the palpebræ, and at this period, on looking deeply into the eye, a yellow opaque substance is generally perceived deeper than the iris, and as if fixed in the vitreous humour. The next step is that the eye assumes somewhat of the appearance of an abscess. A yellow spot is seen on the sclerotic, external to the cornea, which is soft and prominent, and presents precisely the characters of an abscess about to burst. Occasionally, even in the same eye, a similar demonstration of pointing is observed on the iris, as if the matter was about to make its way into

the anterior chamber. At length, after intense and protracted suffering, the swelling bursts in one or both these situations, and a mass of yellow tenacious lymph is pushed forwards, but not discharged, neither does the eyeball collapse. This lymph comes away in flakes and strings, is detached very slowly, and in proportion as it escape the pain abates, but the eye falls down within the socket, and not only is vision lost, but a very unsightly deformity remains that can only be palliated by the closure of the lids, or the adaptation of an artificial eye. It is well for the patient that this disease never attacks both eyes at the same time, and seldom passes from one eye to the other, and thus although condemned to lose the one by a painful, harassing, and nearly incurable affection, he is in less danger of total blindness than from the disease previously described—that which is usually called iritis."

52. *New Mode of Curing Ectropion.*—Dr. Blanbery regards this affection as mainly induced by a peculiar state of the orbicularis muscle, consisting in a preponderance of contractility in the fibres which surround those which form the ciliary portion of the muscle. In a man, aged fifty, with ectropion, Dr. Blanbery found a furrow below the ciliary margin of the lower lid, which became deeper every time the patient closed his eyes forcibly. He made a vertical incision in the lid, and divided some contracted fibres of the muscle, and thus removed the deformity.—*Prov. Med. and Surg. Journ.*, 22d Sept., from *Gazetta di Milano*, 27th Feb., 1847.

53. *Malignant Disease of the Eyeball.*—Mr. Henseley related to the Bath Pathological Society, April 15th, 1847, the following case:—

"A female servant, twenty years of age, had been for two or three months previous to September, 1846, complaining of weakness and loss of health. She had observed a tumour above the left eye, about the size of a small marble, at the upper and inner part of the orbit. It had, on examination, much the feeling of an encysted tumour. The eye was very prominent, and thrust a little outwards. The sight at this time was not much impaired. For some time the tumour appeared stationary, but early in October it began to enlarge; the skin covering it assumed a livid hue; there was effusion beneath the conjunctiva, which produced chemosis. The eye became more prominent; she suffered great pain in the ball itself, but more in the back part of the head. The tumour continued to increase in size; the cornea separated, and the lens and humours of the eye escaped. In December, the other eye became affected, and rapidly increased in size; the cornea separated, and the humours escaped as before. During this time her strength had greatly diminished; she was scarcely able to move in her bed; the pain was most intense, coming on in paroxysms. She often fell into a comatose condition, in which she sometimes remained for twenty-four hours, and was several times thought to be dying, when she would rouse up, call for food, and drink, and make a good dinner, and then in a little time, fall into the same comatose condition again. This state continued for about six months, the intervals of consciousness becoming longer towards the close of that period. There was frequently a discharge of blood from the left eye, and a fœtid discharge from the nostrils. She died at the end of January.

On removing the scalp after death, a bluish-looking spot, about one-third of an inch in length, and one-eighth in breadth, was seen at the posterior inferior angle of the right parietal bone. On separating the pericranium, which was easily accomplished, this spot was found to be a hole in the bone, perforating it completely. Around the hole, the bone was found to be more vascular than usual, and there were several smaller perforations. The bones of the head, generally, were very thin; and on holding the skull-cap between you and the light, it appeared translucent, and at many points perforated. The whole of the inner surface, more especially the posterior portion, (the part where she had felt so much pain during life,) was rough, having the feeling and appearance of grains of sand scattered over it. At the spot corresponding to the perforation of the parietal bone, there were several very large Pacchionian glands, and the dura mater was firmly adherent to the bone, and very vascular. There was slight sub-arachnoid effusion. The anterior lobes of the cerebrum were softened and disorganized, presenting a

pulpy mass, which could with difficulty be removed from its position. The dura mater around was nearly one-quarter of an inch in thickness, and semi-cartilaginous, and adhered so closely to the bone, as to render its detachment impossible A considerable portion of the orbital plates of the frontal bone, more particularly on the left side, and also parts of the ethmoid and sphenoid bones, were destroyed. The optic nerves appeared healthy; the pituitary body was much softened.—*Prov. Med. and Surg. Journ.*, Nov. 17th, 1847.

MIDWIFERY.

54. *On the Primary cause of Puerperal Fever.* By Dr. Scanzoni, of Prague.—Dr. S. commences by stating that the wound produced on the internal surface of the uterus by the detachment of the placenta during parturition, is universally regarded as the peculiar cause of puerperal fever. He considers this view too exclusive, and in opposition to it mentions two or three cases where the symptoms of puerperal fever had shown themselves before labour had commenced, and continued after it to a fatal termination, and there was no hemorrhage, nor putrefaction of the placenta to indicate that that organ had been detached before the proper period of labour. Dr. S. then believes that "the seed of the disease is sown before the commencement of labour;" accordingly he seeks for the germ of the disease in the blood, and, as the peculiar condition of the blood of a puerperal is formed from that of a pregnant female, he conceives that the special predisposing causes of puerperal fever exist in the composition of the blood. In proof of this, the author mentions that in those cases which came under his own observation, where that composition of the blood, which is peculiar to pregnant women, was totally prevented from taking place, or was modified by the presence of some other dyscrasia, the patients were never attacked with puerperal fever, although exposed, in an eminent degree, to that combination of circumstances which is supposed to induce it; and, on the other hand, when, during pregnancy, females are attacked with any disease depending on hyperinosis of the blood, such patients are very liable to suffer from puerperal inflammations, accompanied by copious fibrinous exudations. The author refers to the writings of Helm, Kiwisch, Rokitansky, and Engel, showing that the blood of puerperal females is in a state of hyperinosis, *i. e.* containing an excess of fibrine. The author saw that strong healthy women, in whom this state of hyperinosis of the blood natural to pregnancy had attained its full development, suffered, during a severe epidemic, under that form of puerperal disease which gave indications of an excess of fibrine in the blood, viz. endometritis or peritonitis, accompanied with copious fibrinous exudation, such as is met with in pleuritis and pneumonia.

Physiologists are as yet unable to explain how this augmentation of fibrine is produced. Fibrinous deposits are frequently found in or upon the placentas of mature children, but very rarely has the same alteration been found in the case of premature fœtuses. These deposits are mostly confined to the two last months of pregnancy, and their existence may, according to our author, be accounted for by the active interchange of material which, toward the end of pregnancy, takes place between the maternal and the fœtal blood; the former abounds in fibrine, and if the consumption of this element on the part of the child be diminished, whilst the supply afforded by the mother remain the same, fibrinous deposits must take place, and these probably on the inner surface of the uterus: this is a fact our author has been unable to ascertain, as the inspection of the bodies of women dying during pregnancy are exceedingly rare. The fibrinous deposits in the placenta, however, according to Dr. S., prove that the fœtus does not consume all the fibrine supplied to it, and they lend probability to the idea, that in consequence of the continually increasing supply of fibrine in the circulation of the mother, and the comparatively small consumption of that element on the part of the child, an abnormal accumulation of fibrine must be the result, constituting hyperinosis in the mother.

This fibrinous diathesis, in pregnant females, may pass into secondary dropsy or purulent deposit; secondary dropsy follows from the anemia gradually devel-

oped in consequence of the blood being generally impoverished by copious fibrinous exudation; the dropsical effusion frequently possesses a sero-purulent character.

Purulent deposits may take place in pregnant females, in consequence either of the primary formation of pus in the blood, or of its absorption from an ulcerating surface. According to Mulder, the tritoxyde of protein—or pyin, as some have termed it—contained in the buffy coat of the blood, and which is also more abundant in hyperinotic than in normal blood, has a great tendency to be transformed into pus; which confirms what we might *à priori* have expected, that pus may be formed in the blood, and that it need not necessarily be derived from some ulcerating surface of the body. This is also confirmed by those cases related by the author, in which all the symptoms characteristic of the formation of pus appeared some time before parturition, and were speedily followed thereafter by a fatal termination: it is further corroborated by the fact, that the effects of pyemia are so very frequently observed during puerperal epidemics, and so very rarely in sporadic endometritis or peritonitis; and also by the fact, that the constitution of the atmosphere, about the patient, exercises such a very powerful influence in originating the disease. To the objection that an impure atmosphere exerts its baneful influence as well upon the raw uterine surface as upon the blood circulating through the lungs, and that its local action upon either the one or the other of these organs may, with equal truth be regarded as the primary cause of the disease, the author replies with the fact—which is not unfrequently observed in lying-in wards—that among, say ten or twelve women in the same ward, one in whom labour has been perfectly normal and easy, may speedily show all the indications of puerperal fever, with pyema, and rapidly die; whilst another, in whom a wound really has been inflicted on the uterus by the forcible detachment of an adherent placenta, recovers, without a bad symptom, in a few days:—thus arguing, that the two females being, as far as regards the atmosphere, *in pari statu*, if the noxious influence residing in the air act only on the raw surface of the uterus, the latter patient should have been attacked with the disease, and not the former; but this not being the case, he regards it as a proof that the noxious properties of the atmosphere act with equal, if not greater power, through the lungs than through the uterus. This cannot be doubted, from what has been lately seen of the immense activity of various vapours administered by inhalation. The author regards pus in the veins as an extremely rare appearance, but as very common in the lymphatics; it is found in them either as a consequence of absorption from a distant part, or of inflammation of their proper tissue (lymphangeitis). Among lymphatics of the uterus filled with pus, Dr. S. has found others filled with fibrinous exudation. The latter he regards as a proof that the pus contained in the former does not owe its origin to absorption from a distant ulcerated surface; but that the former also were, at a previous period, filled with fibrinous exudation, which only became purulent secondarily, under the influence of the suppurative process going on in the blood.

The conclusions which Dr. Scanzoni arrives at, are,—1*st*. That a rawness of the internal surface of the uterus does not constitute the sole and only predisposing cause of puerperal fever, but that this consists in a peculiar constitution of the blood. 2*dly*. That this peculiar condition of the blood is indicated by an increase in the quantity of fibrine. 3*dly*. When this increase becomes excessive in a high degree, it constitutes the primary cause of the disease; or it is, in short, in itself the "essence of genuine puerperal fever." 4*thly*. The genuine disease is characterized by the fibrinous type; no other type is genuine, but can only be developed secondarily out of the fibrinous. 5*thly*. Hypinosis of the blood gives immunity against that form of puerperal disease accompanied by fibrinous exudation; it gives but little protection against the suppurative, and none against the typhoid form. 6*thly*. The hyperinotic form of the disease frequently, during epidemics, passes into the purulent or into the typhoid form. 7*thly*. The two last forms may be developed either primarily in the blood, or secondarily by the absorption of pus. 8*thly*. This absorption can take place from suppuration on the surface in the tissue, or appendages of the uterus, or from the placenta. 9*thly*. The cases which run the most rapid course are those which are the result of a primary disease of the blood; the less acute are the result of absorption.—*Monthly Journ.*

Med. Sci., Nov. 1847, from *Prager Vierteljahrschrift für die pract. Heilkunde*, 1846, Bd. xii. S. 1.

55. *Puerperal Convulsions connected with Inflammation of the Kidney.*—Prof. Simpson, in a paper read to the Obstetric Society of Edinburgh, June 15th, pointed out the connection of puerperal convulsions with derangement of the kidney as a very striking fact in Obstetric Pathology. He had seen *post-mortem* appearances of nephritis in some fatal cases of convulsions.

Case I.—In this case, the patient, a delicate female, was exhausted by the pains of labour, and complaining of severe headache when the convulsions supervened. Dr. Niven promptly and easily delivered the child, which was dead, by turning. The convulsions gradually subsided, but re-appeared several times. In the intervals she was profoundly comatose; and, in this state, she died about forty hours after the first attack.

Post-mortem Appearances.—When the lateral ventricle of the right side was opened, fluid blood escaped. The corpus striatum and outer part of the optic thalamus were broken up, and mixed with a large quantity of coagulated blood, forming a clot of large size. The fluid blood was found in the opposite lateral ventricle, also in the third and fourth ventricles. The right kidney was converted into numerous cysts, of about the size of a walnut, containing unhealthy pus, which passed along the ureter and filled the bladder. The left kidney exhibited an advanced stage of Bright's disease.

Case II—Dr. S. lately saw with Dr. Carmichael. The lady had so perfectly recovered after a labour which was quite natural, as to have been out at church, &c. Seven weeks, however, after delivery, after some sudden anomalous affections of sight and hearing for thirty or forty hours previously, she was seized with the most severe convulsions. Despite free evacuations, &c. &c., they continued to recur from time to time, and proved fatal in three hours; the patient during that time never being perfectly sensible. The pelvis of each kidney was filled with a whitish purulent-like matter, and its mucous lining membrane coated with large patches of adherent coagulable lymph, or false membrane. The ventricles of the brain were distended with serous fluid. The urine, when tested, presented no sign of albumen.

Case III.—In a third case, one fit of convulsions came on a month before delivery, and recurred again in a severe and fatal form fourteen days after confinement. During the intervening six weeks she was free from any symptoms, and the labour was natural. The last attack came on suddenly in the evening, about nine o'clock; the convulsions were again and again repeated, and she died comatose in eight hours.

Dr. Maclagan, Dr. Handyside, and Dr. Simpson had examined the urine during this last attack, but found in it no traces of albumen. On inspecting the body, some whitish turbid fluid was found in the renal pelvis, and could be pressed out abundantly from the renal papillæ. It looked like pus. On microscopic examination, it seemed to contain merely a very large quantity of epithelial cells, and no pus globules. Was this inflammatory? There was no effused fibrin or coagulable lymph.—*Monthly Journ. Med. Sci.*, Sept. 1847.

56. *Puerperal Neuritis in the Lower Extremities.*—Dr. Simpson directed the attention of the society to this as another not unfrequent, but neglected form of puerperal disease. He had seen several cases of it, and had found it mistaken for phlebitis and other forms of phlegmasia dolens. It was characterized often by numbness and tingling of the affected limb, and pain, fixed or remittent, passing along the crural or sciatic nerve, down to the knee, calf, or even the foot—increased by pressure along the course of the nerve, and by stretching of the limb, sometimes relieved by strong pressure on the highest portion of the nerves. Sometimes there was no co-existent œdema, or if it were present the pain was in a degree greatly disproportionate to the œdema. It was often very protracted in its course. After local leeching, an elevated position of the limb, the application of belladonna, aconite, &c., greatly relieved the patients.

Various members alluded to cases of this disease which they had seen.—*Ibid.*

57. *Internal Hemorrhage during Pregnancy.*—M. PLAINCHANT has communicated to the Academie de Médecine of Maulins, a case he met with in his practice of very unfrequent occurrence. A strong, healthy, although lymphatic woman, aged 47, the mother of several children, had arrived at the sixth month of her last pregnancy in her usual good health, when one evening she was attacked with pains in her loins and colic; a midwife was called in, who, on examination, found nothing to indicate an approaching miscarriage; the pains, however, became more frequent, she got fainting fits, the skin became cold, the pulse thready, and the patient sank calmly in five hours after the first attack. Nothing had escaped from the vagina. On examination after death, the uterus was found very large and firm; an incision was made into it, and the waters escaped without anything unusual being perceived; the child was well formed for a six months' fœtus; the umbilical cord was uninjured; the placenta was connected with the fundus uteri by a small part of its substance, but was separated to a large extent from it by a quantity of blood, to the amount of about 500 grammes (about 17 oz.) The uterus was very red at this part, but showed no lesion of its texture; two fibrous bodies, each the size of a large nut, were found implanted in the wall of the uterus of the right side.—*Prov. Med. and Surg. Journ.*, Nov. 17, from *Journ. de Méd. et de Chirurg.*

58. *Large Fibrous Tumours of the Uterus complicating Pregnancy and Parturition.*—Dr. SIMPSON, in a communication to the Edinburgh Obstetrical Society, stated reasons for believing that in the above case, the existing compound tumour was the common fibrous or fleshy tumour of the uterus. It was well known that fibrous tumours were very common organic changes in the unimpregnated uterus. He had seen several cases in which, when still small, they were found present, and showed themselves in the form of nodulated irregularities on the surface of the pregnant and puerperal uterus; so that they did not prevent conception. Further, he mentioned the particulars of three cases which he had met with, where fibrous tumours of a large size complicated pregnancy and parturition.

CASE I.—A patient, after being married for ten or twelve years without any issue, passed two menstrual periods. A very large pelvic tumour, which had been long present, began to increase in size. Dr. Simpson then saw her along with Mr. Dixon and Dr. Taylor. There was a very large hard fibrous tumour of the uterus, and low on the left side and in front, a soft elastic part, having much the character of a dropsical ovary. And it is well known, that fibrous tumours of the uterus and multilocular dropsy of the ovary sometimes co-exist; but Dr. Simpson knew no other kind of cystic collection ever existing along with fibrous uterine tumours. In this case, however, the soft fluctuating part was not the ovary, for it was situated *anteriorly* to the hard uterine tumour, whilst diseased ovaries lie *posteriorly* to the uterus. This led Dr. Simpson to suspect pregnancy, improbable as it otherwise was, and to hazard a diagnosis to that effect. It proved correct. The fœtal heart was heard about the fifth month, and pregnancy went on the full time. During labour, one portion of the tumour filled up so much of the brim of the pelvis, that the child required to be extracted by turning. It was still-born. The mother made a good recovery.

CASE II.—A patient applied to Dr. Simpson with a large pelvic tumour. She was suffering from dysuria, &c., and had not menstruated for three months. Dr. Simpson found the uterus retroverted, and an enormous fibrous tumour in the walls of the organ. The case was at this time seen by Dr. Renton, Dr. Ziegler, and others. The uterus was replaced by Dr. Simpson with difficulty, and some weeks subsequently the fœtus was expelled. About a year afterwards, the same patient again became pregnant and went to the full time. The labour was extremely tedious—a portion of the tumour diminishing the brim of the pelvis—and at last the child was expelled by the spontaneous efforts of the uterus, but with the head greatly compressed and flattened. The mother recovered rapidly. In the unimpregnated state, the fibrous tumour in this instance reaches to the umbilicus, and is as large as a uterus at the fifth or sixth month of pregnancy. The uterine cavity is found by the uterine sound to be six inches in length.

CASE III.—A patient, pregnant for the first time, who had been long delicate, arrived at the full term of utero-gestation, and after a somewhat tedious labour, was delivered of a dead child. There was a slight degree of hemorrhage, but it

was easily arrested. From the time, however, of delivery onwards, the patient continued to sink—became faint and listless, and then comatose—and died in this state five or six hours subsequently. She seemed never to rally from the "shock" accompanying delivery. Dr. Malcolm saw her with Dr. Simpson. On opening the body, they found the uterine parietes thickly studded with fibrous tumours, and counted as many as forty hanging in a more or less pediculated form, from its external or peritoneal surface; and of all sizes, from an orange downwards. They were easily diagnosticated through the abdominal parietes during her life. The cavity of the uterus contained no collection of blood.

In addition, Dr. Simpson alluded to two cases of large fibrous tumours complicating labour, published in the *Dublin Medical Journal*, the one by Dr. Montgomery, the other by Dr. Beatty. In the former, the fibrous tumour having entered the pelvis, formed such an obstruction to the passage of the child that the Cæsarean section was required. In Dr. Beatty's case, it was supposed, before the commencement of the labour, that the same proceeding would be necessary; but, in the course of the labour, the tumour was gradually raised by the uterine contractions out of the pelvis, and the child spontaneously expelled.—*Proceedings of Edinburgh Obstetrical Society*, May 12th, in *Month. Journ. Med. Sci.*, Aug. 1847.

—

59. *What Practice should be followed in cases of large Fibrous Tumours complicating Pregnancy.*—Dr. Simpson adduced the opinion of Dr. Ashwell, who, in discoursing on this subject, inculcates the propriety of inducing premature labour in order to evade the danger of inflammation of the pelvic tissues and peritoneum, and the still more hazardous evils of unhealthy softening, suppuration and ulceration of the tumours themselves. But Dr. Simpson stated that he entertained very serious doubts of the correctness of the observation of Dr. Ashwell, that fibrous tumours had a tendency to soften during the latter months more than at any other period of pregnancy; and disapproved of the induction of premature labour as a general rule of treatment in such cases, believing, as he did, that the excitement of the uterus by artificial means to the premature expulsion of its contents, would be as likely to induce such anticipated morbid actions, as the supervention and completion of a natural pregnancy and labour. He believed, that the only cases of this kind which demanded the induction of premature labour were those in which the tumour encroached upon the brim of the pelvis, and thus produced such contraction of the maternal passages as rendered a natural labour impossible.—*Ibid.*

—

60. *Treatment of Fibrous Tumours in the Unimpregnated Uterus.*—Dr. Simpson called attention to the manner in which nature sometimes proceeds to stop the progress of these tumours; namely, by the gradual transformation of their fibrous tissue, firstly, into a cartilaginous and then into an earthy and almost inorganic mass, not prone to enlarge or change its condition. He stated, that this alteration seemed to indicate the death, or at least the cessation of the reproductive action of those cells which form the essential growing constituent of the tumour. He cited, in illustration, the analogous case of some entozoa, particularly the *trichina* and *cysticercus*, which, after their death, were sometimes found, with their containing cysts, ossified. Further, Dr. Simpson mentioned the interesting experiments of Rayer, in which that pathologist induced the artificial transformation of normal fibrous tissue (such as the ear of the rabbit), into cartilaginous and osseous substance by the repeated or continued irritation of it. And, as a result of these remarks, Dr. Simpson suggested the possible induction of osseous transformation as an indication of treatment in fibrous uterine tumours. He thought that the repeated transmission of a galvanic current through the tumour might possibly produce the required degree of irritation and its desired result.—*Ibid.*

—

61. *Abdominal Tumour Simulating Pregnancy.*—[The following very remarkable case is related by M. Challice, (*Lancet*, Oct. 16, 1847.) and affords another illustration of the necessity of caution in pronouncing in regard to the existence of pregnancy. The use of the stethoscope would have prevented the mistake made in this instance.]

On the morning of the 12th of August, 1846, a messenger came to me, breathless, saying that her mistress's daughter was dangerously ill with the cholera, and

that I must come directly. On my way the maid-servant dropped several hints, at first rather obscure, afterwards of a less doubtful character. "She hoped it was nothing worse than the cholera;" and persons who had their living to get "could see, although they daren't say nothing." These innuendoes, conveyed in a tone and manner not to be mistaken, led me to the conclusion, that on my arrival I should find the patient in the pangs of parturition. When I arrived, I saw a young female in bed, lying on her right side, with her face buried in the pillow, and the knees drawn up towards the abdomen. She seemed to be in pain, but was sullen, and refused to answer any questions. The mother told me that she had been vomiting, and complaining of pains in the loins, with a constant desire to pass water, and that for the last five or six months she had observed a change in her daughter—the appetite capricious, temper irritable, and on several occasions she had been surprised in tears; notwithstanding, she denied being ill, and continued to perform her domestic duties. These facts seemed confirmatory of the servant's suspicions, and with almost a conviction in my mind of the condition of the girl, I placed my hand upon the abdomen: it was tense and swollen, and a movement like that of a living fœtus was distinctly felt: I then listened and detected a loud and quick pulsation.

The presence of these symptoms induced me to pronounce the patient pregnant. No suspicion had entered the mother's mind: she was an only daughter, and bore an excellent character. However, she did not deny the fact, but after a distressing burst of grief, and a pitiable appeal for forgiveness, she confessed that her "Cousin John had had connexion with her once, and only once, about six months before, a few days previous to his departure from England." Being unwilling to aggravate the sufferings I then witnessed, by what appeared unnecessary inquiries, or to disturb the patient by further and more careful examination, considering the case quite decisive, I contented myself with prescribing some simple remedy for relieving the sickness and pain. The next day there was a great improvement in the condition of the patient; the fear of discovery no longer agitated her, and she had been forgiven. Up to this period she had so contrived to compress her figure, that no increase in her bulk was perceptible when dressed, although her size was quite that of the sixth month of gestation when undressed. Now that this cruel mental and physical restraint no longer tormented her, she suffered less from pain and sickness, became less sullen, and more communicative.

It appears that the connection took place, after prolonged resistance, just previous to the usual period of menstruation; that up to that time there had never been the least irregularity of this function during the three years she had menstruated.

She was greatly alarmed at the absence of the accustomed appearances at the usual time, and did not feel well in health, although she had no marked symptoms; a general sense of uneasiness, with pains in the loins, and an occasional slight feeling of sickness and loss of appetite, were felt. When the next period came round, she was pleased at finding herself "unwell," but only to about half the usual extent; menstruation had continued regularly up to the time I saw her; on each occasion, however, more and more scantily. The abdomen had gone on gradually increasing in bulk, and about five months after the connection the patient was conscious of a movement and pulsation in the abdomen, and believed herself pregnant. The breasts were small, and marked with an indistinct areola; around the eyes and mouth there were dark circles, and her mother says she is much fallen away in flesh. Previous to this unfortunate occurrence, the patient not only enjoyed good health, but was remarkable for strength, endurance, and activity, inclined to *embonpoint*, full of life and spirits, and in her nineteenth year.

During the next month or six weeks, I saw the patient occasionally. She complained of no urgent symptom, walked out now and then, had a good appetite and digestion, with sometimes slight irritability of the bladder, and irregularity of the bowels. The gradual increase in size still went on, and the mother (who now slept with her daughter) said that the movement of the child continued. The patient complained of its violence when in bed, and also began to suffer from lumbar pains, and constant irritation of the labia, which was much increased when she drank beer, wine, or spirits. And so the case went on.

When the ninth calendar month had nearly expired since the connection, I re-

came much interested in the case, thinking it one in which the period of gestation could be accurately ascertained.

On the evening of the expiration of the ninth month, I received the expected message, with an urgent request to hasten, as very strong labour had come on. When I arrived the patient was standing at the foot of the bed, grasping the bed post, and evidently suffering from pain, although not of a violent character. There was an interval of about ten minutes in the pains, during which she walked about the room, having a very anxious and haggard look.

After a good deal of persuasion, she consented to an examination per vaginam, which seemed to cause excessive pain, as she screamed violently, and exclaimed that she was being murdered. At the time, I thought the patient hysterical, but was much surprised at the narrow, constricted condition of the vagina, and the presence of the hymen nearly perfect; the agony, however, produced by the examination, seemed so intolerable, that the patient, by a sudden and violent effort, threw herself from me, declaring that I should torment her no more.

Finding that the pains were weak and ineffectual, and at longer intervals, and feeling assured, from the condition of the parts, that immediate labour was not at hand, I gave twenty minims of opium, and left, directing a full dose of castor oil to be given in a few hours. During the night she slept well; the oil acted freely in the morning; and the next day passed over without pain or any inconvenience, the patient having a good appetite, and being in better spirits. About eleven o'clock at night the pains returned with increased violence, and I found her straining and bearing-down at the bed post. An old-experienced nurse declared "that the pains were quite strong enough, with *assistance*, to bring the child into the world." The mother states, that during the night she had placed her hand on her daughter's stomach, and felt the child move vigorously.

In the intervals of pain, the patient walked about the room, and was cheerful, except expressing what seemed an unreasonable horror at any examination. The pains commenced in the abdomen, and then extended round to the loins, came on regularly every ten or fifteen minutes, and were marked with all the characteristics of labour in its first stage.

The extreme excitement and dread which the patient evinced, when the necessity for an examination was impressed upon her, induced me to waive it, although I was anxious to ascertain the real condition of affairs. It would be useless to detail the diurnal symptoms—suffice it, that a week passed over, and matters remained apparently without alteration, either one way or the other. I may here state, that menstruation did not take place at this period. Doubts now first began to arise in my mind about the nature of the case, and when nine calendar months from the departure of her cousin had expired, I became very anxious about it. It was at this stage, that Dr. Lever was consulted. After a careful and thorough external and internal examination, this gentleman, justly famous for his skill and tact in diagnosis, having the history of the case before him, came to the conclusion that it was "extra-uterine impregnation." At that time her physical condition was as follows:—Countenance pale—an anxious expression; eyes rather sunken; nose pinched; breasts somewhat flaccid; abdomen the size of mature pregnancy, if not larger; pulse never less than 100; the tongue clean, but morbidly red; bowels sometimes costive for a day or two, at other times, the reverse; urine most frequently pale and copious, but on some occasions thick, scanty, and high-coloured. Over the entire abdominal region, a distinct pulsation could be heard and felt; but owing to the extreme excitability of the patient, it was almost impossible to ascertain whether or not it was synchronous with the pulse. Palliative measures were adopted, and the case, now becoming one of painful interest, was closely watched. During the next fortnight, no perceptible alteration occurred, except that the pulsation in the tumour became less distinct, and the abdomen more tense. Dr. Ferguson now visited the patient, and pronounced the abdominal pulsation to be synchronous with the heart's action, and doubted whether impregnation had taken place at all. On his recommendation, I punctured the abdomen with a fine "trochar," and drew off about five pints of thick grumous and offensive matter. Great relief followed the operation, only, however, temporary; for in the course of a short time, the abdomen became as tense as before, and all the patient's sufferings returned. The interest, in a further detail of the symptoms

of this case, here ceases, no doubt now being entertained of its character. After a second and a third tapping, the poor girl gradually got weaker and weaker, her only comfort the oblivion produced by anodynes; and on the 15th of February she died.

The day following, assisted by my friend, Mr. Druitt, we made a post-mortem examination. The upper portion of the body was extremely emaciated, but, owing to slight œdema of the lower extremities, this appearance was not general. Abdomen greatly distended, and marked by enlarged veins; it measured in circumference fifty-eight inches. About a gallon of fluid was drawn off by the trochar, previous to making a free incision, after which, nearly a pailful of brain-like matter rolled out. This had been contained in a cyst, which extended from the pubis to the ensiform cartilage, and from the left to the right hypochondrium; in some parts, the walls of the sac were more than an inch thick, and of a fibro-cartilaginous consistence; the anterior portion adhered firmly to the abdominal parietes, the upper being formed by the inferior surface of the liver; that organ was bathed with the contents of the sac, and became inoculated, several small cysts, filled with medullary sarcoma, having formed in its substance. There were, also, many isolated cysts, varying from the size of a hazelnut, to that of a pigeon's egg, formed in the walls of the cyst; these had no connection with each other, or communication with the general cavity. The uterus was found imbedded in the lower portion, or base of the cyst; no trace of the ovaries could be met with; the bladder was small, but not affected by disease.

—

62. *Use of Auscultation in the Treatment of Labours.*—The *Dublin Quarterly Journ. of Med. Sci.* for August last, contains an interesting memoir on this subject, by Dr. M'Clintock, the materials for which were collected by him in the wards of the Dublin Lying-in Hospital, whilst he was assistant in that institution. The following aphorisms contain the chief points of practical interest contained in this memoir.

1. Where the fœtus is alive, the sounds of its heart may be always detected at some period of the labour, by any one of ordinary proficiency in obstetric auscultation.

2. The precise region of the abdomen in which the fœtal heart is heard, affords auxiliary evidence of the position of the child in *utero*, but can never be relied on alone for determining this point, or supersede the necessity for vaginal examination.

3. In presentations of the lower extremities, whether it be breech, foot, or knee, the fœtal heart is usually heard most distinctly in the vicinity of the umbilicus of the mother.

4. Conclusive auricular evidence of the existence of twins *in utero* is only to be drawn from the inequality in the number of the beats of the two fœtal hearts, and not merely from any difference as to their respective positions.

5. If, in the course of a tedious or difficult labour, the fœtal cardiac sounds, from having been distinct and clear, gradually become feeble and obscure, and ultimately inaudible, even with every precaution against deception; under these circumstances, their absence is entitled to rank as positive evidence of the child's death; but without the previous successive examinations this conclusion would be destitute of any positive character.

6. In cases where ergot of rye has been given to hasten delivery, ausculation of the fœtal heart is the only certain way by which we can know when the medicine is commencing to exert an injurious influence upon the child; consequently, the stethoscopic indications are alone entitled to confidence for determining the exact time when the state of the fœtus calls for, and justifies interference.

7. In cases simulating rupture of the uterus, the persistence of the fœtal heart's sound is a strong proof against the occurrence of the accident, and the more advanced the period at which they are audible after the setting in of bad symptoms, the more conclusive is the evidence that rupture has not taken place; whilst, on the other hand, the sudden cessation of the fœtal pulsations, where they had been distinctly audible a short time previously, would strongly corroborate other existing symptoms of laceration of the uterus.

8. After an attack of puerperal convulsions in the seventh or eighth month of

pregnancy, where labour has not immediately supervened, the prognosis should be very much regulated by the state of the fœtus; for if it be proved by the stethoscope that the child is alive, we may venture to hope that gestation will go on undisturbed (unless the convulsions recur); whereas, if the child has been destroyed, its expulsion will take place, most probably, in ten or fourteen days from the date of the convulsive attack.

9. No certain conclusion regarding the state of the fœtus can be drawn from the characters of the placental soufflet.

10. In cases of flooding before delivery, observation of the placental bruit may supply useful diagnostic information, by pointing out the part of the uterus to which the after-birth is attached, and thereby showing whether the hemorrhage be accidental or unavoidable.

11. Auscultation of the heart in still-born children more accurately acquaints us with the state of the child's vital powers, than any other source of information, and is, therefore, well deserving of employment in all such cases.

—

63. *Spontaneous Rupture of the Uterus from thinness of the Parietes.*—Mrs. —— was taken in a labour, I believe at her full time. The labour appeared to be going on naturally, when suddenly symptoms of great depression occurred, accompanied with vomiting and extreme tenderness of the abdomen, and the patient sunk rapidly, dying a few hours after the first accession of the dangerous symptoms. On examination after death, there did not appear to be any malformation of the pelvis, or disproportionate size of the child. She had borne several children, and her labours had been natural, though rather lingering. The cause of the rupture appeared to be, that one-half of the uterus, as the fœtus increased in size, merely dilated, but did not increase in thickness as it should have done, so that whilst the cavity of the uterus was of the size it ought to have been in pregnancy, the substance of the walls of one-half was little thicker than brown paper, the substance of the other half being of the proper thickness. It appeared, therefore, when labour came on, that the part of the uterus which was thus preternaturally alienated had been unable to resist the tension, and had given way. Nothing was discovered to account for this want of nutrition. The patient had generally enjoyed tolerable health. The true nature of the case, though suspected, was not ascertained till after death.—*Lond. Med. Gaz.*, Oct. 1847.

—

64. *A new method of bringing on Premature Delivery.*—The German journals contain the account of a new method of inducing premature labour, where required, as practised by M. Cohen, of Hamburg. That physician has been led to employ the subjoined method from noticing the power of injections into the uterus, in developing contractions of that organ; and as the pregnant uterus is in a condition apt to contract, he thought injections might be efficaciously used, and that without danger, to bring on delivery, in those cases where it is necessary the fœtus should be expelled before the full term of pregnancy.

In the carrying out of his plan, M. Cohen has used a common small syringe, holding from one ounce and a half to two ounces of liquid, and furnished with a canula eight or nine inches in length, about one-eighth of an inch in diameter at its extremity, and curved like a female catheter. The patient is placed on her back, and the pelvis slightly raised. Two fingers are then passed into the vagina as far as the posterior lip of the uterus, in order to guide the canula, which is introduced between the anterior wall of the uterus and the ovum. The free extremity of the syringe is now lowered so as to allow the canula to glide under the pubic arch until it penetrates about two inches into the uterus, and at this point the injection is begun. The fluid is injected slowly and gently, taking care so to raise the syringe that the extremity of the canula may not abut against the wall of the uterus, and to vary its direction whenever any obstacle occurs to the escape of the liquid; the syringe is also withdrawn by degrees. Ten minutes afterwards, the woman may get up and walk about. If at the end of six hours there is no sign of approaching labour, the operation may be repeated.

Dr. Cohen has used for injection tar-water, which fluid he has also employed to diminish excessive secretion from the uterine surface. The author gives a case in which he resorted to this plan of injecting with success, it was one of

contracted pelvis—contracted in all its diameters, and hardly equal in size to that of a young girl twelve years old. This woman's first delivery was accomplished by craniotomy and the forceps; and M. Cohen advised, in the case of a second pregnancy, to induce premature labour, which was accordingly done by him, when the woman was the next time with child, according to the preceding plan, and after two injections were performed, at an interval of six hours. The child was born footling, and survived; and the mother had a very favourable convalescence.

The preceding plan appears to possess the advantage of inducing labour so gradually as to allow of the dilatation of the os uteri before the bursting of the membranes, and the forcing against it of the harder presenting part. Most of the methods now employed to bring on labour are apt to cause very sudden and violent contractions, with the almost immediate rupture of the membranes, which is a disadvantage; and therefore, if no objection seem to attach to the proceeding of M. Cohen, it would be preferable. It has this disadvantage, that it is not so simple of execution as the mere introduction of a catheter to rupture the membranes, or to separate them from the walls of the uterus.—*Lancet*, Sept. 25, 1847.

ANÆSTHETIC AGENTS.

[In our last number we presented a fair and unbiassed report of the then existing state of knowledge in regard to the use of ether as a means of annulling pain, in order to enable the reader to judge how far the use of this agent was safe or expedient. We shall now, in furtherance of the same object, endeavour to bring together the prominent facts and opinions which have since been brought forward. Previously, however, to doing this, we must give an account of a new anæsthetic agent, very recently proposed by Prof. Simpson, of Edinburgh, as a substitute for the sulphuric ether, and which is now lauded as very superior to the latter in several respects. The discovery, in this country, of the property of ether of annulling pain, has given an impulse to investigation in that direction, and other articles may be hereafter discovered, possessing anæsthetic powers superior to any yet known. Even, however, should this happen and the ether be entirely superseded by another more efficient and safer agent, still, a large portion of honour must be awarded to our countrymen, for having stricken out the path which has led to the discovery.]

65. *Account of a new Anæsthetic Agent, as a Substitute for Sulphuric Ether in Surgery and Midwifery.* By J. Y. Simpson, M. D., F. R. S. E., Prof. Mid. Univ. Edinburgh, &c. (Communicated to the Med.-Chirurg. Soc. of Edinburgh, Nov. 10, 1847.) [Just as we were closing this number we received from the author a copy of the following paper, which we hasten to present entire to our readers.]

From the time at which I first saw ether-inhalation successfully practised in January last, I have had the conviction impressed upon my mind, that we would ultimately find that other therapeutic agents were capable of being introduced with equal rapidity and success into the system, through the same extensive and powerful channel of pulmonary absorption. In some observations, which I wrote and published in February last, relative to the inhalation of sulphuric ether in midwifery, I stated that, in several obstetric cases, I had used ergot of rye in this way, along with ether.—(See *Monthly Journal of Medical Science*, pp. 724 and 795. Case of Successful Inhalation of Opium, to Arrest the Vomiting of Pregnancy.)

With various professional friends, more conversant with chemistry than I am, I have, since that time, taken opportunities of talking over the idea which I entertained of the probable existence or discovery of new therapeutic agents, capable of being introduced into the system by respiration, and the possibility of producing for inhalation vaporizable or volatile preparations of some of our more active and old established medicines: and I have had, during the summer and autumn, ethereal tinctures, &c., of several potent drugs, manufactured for me, for experiment, by Messrs. Duncan, Flockhart, & Co., the excellent chemists and druggists of this city.

Latterly, in order to avoid, if possible, some of the inconveniences and objections pertaining to sulphuric ether,—(particularly its disagreeable and very persistent smell, its occasional tendency to irritation of the bronchi during its first inspirations, and the large quantity of it occasionally required to be used, more especially in protracted cases of labour,)—I have tried upon myself and others the inhalation of different other volatile fluids, with the hope that some one of them might be found to possess the advantages of ether, without its disadvantages. For this purpose, I selected for experiment, and have inhaled several chemical liquids of a more fragrant or agreeable odour, such as the chloride of hydrocarbon (or Dutch liquid), acetone, nitrate of oxide of ethyle (nitric ether), benzoin, the vapour of iodoform, &c.* I have found, however, one infinitely more efficacious than any of the others, viz., chloroform, or the perchloride of formyl, and I am enabled to speak most confidently of its superior anæsthetic properties, having now tried it upon upwards of thirty individuals. The liquid I have used has been manufactured for me by Mr. Hunter, in the laboratory of Messrs. Duncan, Flockhart & Co.

Chloroform was first discovered and described at nearly the same time by Soubeiran (1831), and Liebig (1832); its composition was first accurately ascertained by the distinguished French chemist, Dumas, in 1835.—See the *Annales de Chimie et de Physique*, vols. xlviii., xlix., and lviii. It has been used by some practitioners internally; Guillot prescribed it as an anti-spasmodic in asthma, exhibiting it in small doses, and diluted 100 times. (See Bouchardat's *Annuaire de Therapeutique*, for 1844, p. 35.) But no person, so far as I am aware, has used it by inhalation, or discovered its remarkable anæsthetic properties till the date of my own experiments.

It is a dense, limpid, colourless liquid, readily evaporating, and possessing an agreeable, fragrant, fruit-like odour, and a saccharine pleasant taste.

As an inhaled anæsthetic agent, it possesses over sulphuric ether the following advantages:—

1. A greatly less quantity of chloroform than of ether is requisite to produce the anæsthetic effect; usually from a hundred to a hundred and twenty drops of chloroform only being sufficient; and with some patients much less. I have seen a strong person rendered completely insensible by six or seven inspirations of thirty drops of the liquid.

2. Its action is much more rapid and complete, and generally more persistent. I have almost always seen from ten to twenty full inspirations suffice. Hence the time of the surgeon is saved; and that preliminary stage of excitement, which pertains to all narcotizing agents, being curtailed, or indeed practically abolished, the patient has not the same degree of tendency to exhilaration and talking.†

* In talking over, with different chemists, what fluids might be sufficiently volatile to be respirable, and hence deserving of being experimented upon, Mr. Waldie first named to me the perchloride of formyl as worthy, among others, of a trial;—Dr. Gregory suggested a trial of the chloride of hydrocarbon, &c. I have been deeply indebted to Dr. Gregory and Dr. Anderson, for their kindness in furnishing me with the requisite chemical agents for these experiments;—and also to my assistants, Dr. Keith and Dr. Duncan, for the great and hearty zeal with which they have constantly aided me in conducting the inquiry.

† In practice I have found that any such tendency, even with ether, is avoided by, 1st, giving the patient from the first a large and overwhelming dose of the vapour, and 2dly, by keeping him perfectly quiet and still, and preventing all noise and talking around him. I have elsewhere insisted on the importance of these points. (See the numbers of the *Monthly Journal of Medical Science*, for March, 1847, p. 726, and for September, p. 154.) In the paper last referred to, I took occasion, when discussing the conditions requisite for insuring successful etherization, to observe, "*First*, The patient ought to be left, as far as possible, in a state of absolute quietude and freedom from mental excitement, both during the induction of etherization, and during his recovery from it. All talking and all questioning should be strictly prohibited. In this way any tendency to excitement is eschewed, and the proper effect of the ether inhalation more speedily and certainly induced. And, *Secondly*, with the same view, the primary stage of exhilaration should be entirely avoided, or at least reduced to the shortest possible limit, by impregnating the respired air as fully with the ether vapour as the patient can bear, and by

3. Most of those who know from previous experience the sensations produced by ether inhalation, and who have subsequently breathed the chloroform, have strongly declared the inhalation and influence of chloroform to be far more agreeable and pleasant than those of ether.

4. I believe, that considering the small quantity requisite, as compared with ether, the use of chloroform will be less expensive than that of ether; more especially, as there is every prospect that the means of forming it may be simplified and cheapened.

5. Its perfume is not unpleasant, but the reverse; and the odour of it does not remain, for any length of time, obstinately attached to the clothes of the attendant, —or exhaling in a disagreeable form from the lungs of the patient, as so generally happens with sulphuric ether.

6. Being required in much less quantity, it is much more portable and transmissible than sulphuric ether.

7. No special kind of inhaler or instrument is necessary for its exhibition. A little of the liquid diffused upon the interior of a hollow-shaped sponge, or a pocket-handkerchief, or a piece of linen or paper, and held over the mouth and nostrils, so as to be fully inhaled, generally suffices in about a minute or two to produce the desired effect.*

I have not yet had an opportunity of using chloroform in any capital surgical operation, but have exhibited it, with perfect success, in tooth-drawing,† opening abscesses, for annulling the pain of dysmenorrhœa and of neuralgia. and in two or three cases where I was using deep and otherwise very painful galvano-puncture for the treatment of ovarian dropsy, &c. I have employed it also in obstetric

allowing it to pass into the lungs both by the mouth and nostrils, so as rapidly and at once to superinduce its complete and anæsthetic effect; * * * * a very common but certainly a very unpardonable error being to exhibit an imperfect and exciting, instead of a perfect and narcotizing dose of the vapour. Many of the alleged failures and misadventures are doubtless entirely attributable to the neglect of this simple rule;—not the principle of etherization, but the mode of putting it in practice being altogether to blame. But, *Thirdly*, whatever means or mode of etherization is adopted, the most important of the conditions required for procuring a satisfactory and successful result from its employment in surgery, consists in obstinately determining to avoid the commencement of the operation itself, and never venturing to apply the knife *until* the patient is under the full influence of the ether-vapour, and *thoroughly and indubitably soporized by it.*" In fulfilling all these indications, the employment of chloroform evidently offers great and decided advantages, in facility and efficiency, over the employment of ether.

* When used for surgical purposes, perhaps it will be found to be most easily given upon a hankerchief, gathered up into a cup-like form in the hand of the exhibitor, and with the open end of the cup placed over the nose and mouth of the patient. For the first inspiration or two, it should be held at the distance of half an inch or so from the face and then more and more closely applied to it. To insure a rapid and perfect anæsthetic effect—more especially where the operation is to be severe—one or two teaspoonfuls of the chloroform should be at once placed upon the hollow of the hankerchief, and immediately held to the face of the patient. Generally a snoring sleep speedily supervenes; and when it does so, it is a perfect test of the superinduction of complete insensibility. But a patient may be quite anæsthetic without this symptom supervening.

† A young dentist who has himself had two teeth extracted lately—one under the influence of ether, and the other under the influence of chloroform—writes me the following statement of the results:—"About six months ago I had an upper molar tooth extracted whilst under the influence of ether, by Mr. Imlach. The inhalation was continued for several minutes before I presented the usual appearance of complete etherization; the tooth was then extracted; and, although I did not feel the least pain, yet I was conscious of the operation being performed, and was quite aware when the crash took place. Some days ago I required another molar extracted on account of tooth-ache, and this operation was again performed by the same gentleman. I inhaled the vapour of chloroform, half a drachm being poured upon a handkerchief for that purpose, and held to my nose and mouth. Insensibility took place in a few seconds; but I was so completely *dead* this time, that I was not in the very slightest degree aware of anything that took place. The subsequent stupefying effects of the chloroform went off more rapidly than those of the ether; and I was perfectly well and able again for my work in a few minutes."

practice with entire success. The lady to whom it was first exhibited during parturition, had been previously delivered in the country by perforation of the head of the infant, after a labour of three days' duration. In this, her second confinement, pains supervened a fortnight before the full time. Three hours and a-half after they commenced, and, ere the first stage of the labour was completed, I placed her under the influence of the chloroform, by moistening, with half a teaspoonful of the liquid, a pocket handkerchief, rolled up into a funnel shape, and with the broad or open end of the funnel placed over her mouth and nostrils. In consequence of the evaporation of the fluid, it was once more renewed in about ten or twelve minutes. The child was expelled in about twenty-five minutes after the inhalation was begun. The mother subsequently remained longer soporose than commonly happens after ether. The squalling of the child did not, as usual, rouse her; and some minutes elapsed after the placenta was expelled, and after the child was removed by the nurse into another room, before the patient awoke. She then turned round and observed to me that she had "enjoyed a very comfortable sleep, and indeed required it, as she was so tired,* but would now be more able for the work before her." I evaded entering into conversation with her, believing, as I have already stated, that the most complete possible quietude forms one of the principal secrets for the successful employment of either ether or chloroform. In a little time she again remarked that she was afraid her "sleep had stopped the pains." Shortly afterwards, her infant was brought in by the nurse from the adjoining room, and it was a matter of no small difficulty to convince the astonished mother that the labour was entirely over, and that the child presented to her was really her "own living baby."

Perhaps I may be excused from adding, that since publishing on the subject of ether inhalation in midwifery, seven or eight months ago,† and then for the first time directing the attention of the medical profession to its great use and importance in natural and morbid parturition, I have employed it, with few and rare exceptions, in every case of labour that I have attended; and with the most delightful results. And I have no doubt whatever, that some years hence the practice will be general. Obstetricians may oppose it, but I believe our patients themselves will force the use of it upon the profession.‡ I have never had the pleasure of watching over a series of better and more rapid recoveries; nor once witnessed any disagreeable result follow to either mother or child; whilst I have now seen an immense amount of maternal pain and agony saved by its employment. And I most conscientiously believe that the proud mission of the physician is distinctly twofold—namely, to alleviate human suffering, as well as preserve human life.

Chemical Constitution of Chloroform.—Formyl is the hypothetical radical of formic acid. In the red ant (*formica rufa*) formic acid was first discovered, and hence its name. Gehlen pointed it out as a peculiar acid; and it was afterwards first artificially prepared by Doebereiner. Chemists have now devised a variety of processes, by which formic acid may be obtained from starch, sugar, and indeed, most other vegetable substances.

A series of chlorides of formyl are produced when chlorine and the hyperchlorites are brought to act on the chloride, oxide, and hydrated oxide of methyl, pyroxylic or wood spirit). In the same way as formic acid may be artificially procured from substances which do not contain formyl ready formed,—so also are the chlorides of this radical capable of being procured from substances which do not originally contain it.

Chloroform, chloroformyl, or the perchloride of formyl, may be made and obtained artificially by various processes,—as by making milk of lime, or an

* In consequence of extreme anxiety at the unfortunate result of her previous confinement, she had slept little or none for one or two nights preceding the commencement of her present accouchement.

† See *Monthly Journal of Medical Science*, for February, p. 639; for March, p. 718 and 721; and April, p. 794, &c.

‡ I am told that the London physicians, with two or three exceptions only, have never yet employed ether inhalation in their midwifery practice. Three weeks ago, I was informed in a letter from Professor Montgomery, of Dublin, that he believed that in that city, up to that date, it had not been used in a single case of labour.

aqueous solution of caustic alkali act upon chloral,—by distilling alcohol, pyroxylic spirit, or acetone, with chloride of lime,—by leading a stream of chlorine gas into a solution of caustic potass in spirit of wine, &c. The preparation which I have employed, was made according to the following formula of Dumas:—

"℞.—Chloride of lime in powder, ... ℔iv.
Water, ... ℔xii.
Rectified Spirit . . . . . f℥xii.

"Mix in a capacious retort or still, and distill as long as a dense liquid, which sinks in the water with which it comes over, is produced."—(Gray's *Supplement to the Pharmacopœia*, 1846, p. 633.)

The resulting perchloride of formyl consists of two atoms of carbon, one of hydrogen, and three of chlorine. Its specific gravity is much greater than that of water, being as high as 1·480. It boils at 141°. The density of its vapour is 4·2. It is not inflammable; nor changed by distillation with potassium, potash, sulphuric, or other acids.—(See Turner's *Elements of Chemistry*, 8th edition, p. 1009; Gregory's *Outlines of Chemistry*, part ii. p. 401; Fownes' *Manual of Elementary Chemistry*, p. 419; Thomson's *Chemistry of Organic Bodies*, p. 312; Loewig's *Organische Chemie*, vol. i. p. 498.)

It is now well ascertained that three compound chemical bodies possess, when inhaled into the lungs, the power of superinducing a state of anæsthesia, or insensibility to pain in surgical operations, &c., namely, nitrous oxide, sulphuric ether, and perchloride of formyl. The following tabular view shows that these agents are entirely different from each other in their chemical constitution, and hence that their elementary composition affords no apparent clue to the explanation of their anæsthetic properties:—

	Propor. of Nitrogen.	Propor. of Oxygen.	Propor. of Carbon.	Propor. of Hydrogen.	Propor. of Chlorine.
Nitrous Oxide,	1 Atom.	1 Atom.			
Sulphuric Ether,		1 Atom.	4 Atoms.	5 Atoms.	
Chloroform,			2 Atoms.	1 Atom.	3 Atoms.

It is perhaps not unworthy of remark, that when Soubeiran, Liebig, and Dumas engaged, a few years back, in those inquiries and experiments by which the formation and composition of chloroform was first discovered, their sole and only object was the investigation of a point in philosophical Chemistry. They laboured for the pure love and extension of knowledge. They had no idea that the substance to which they called the attention of their chemical brethren could or would be turned to any *practical* purpose, or that it possessed any physiological or therapeutic effects upon the animal economy. I mention this to show, that the *cui bono* argument against philosophical investigations, on the ground that there may be at first, no apparent practical benefit to be derived from them, has been amply refuted in this, as it has been in many other instances. For I feel assured, that the use of chloroform will soon entirely supersede the use of ether; and, from the facility and rapidity of its exhibition, it will be employed as an anæsthetic agent in many cases, and under many circumstances, in which ether would never have been had recourse to. Here, then, we have a substance which, in the first instance, was merely interesting as a matter of scientific curiosity and research, becoming rapidly an object of intense importance, as an agent by which human suffering and agony may be annulled and abolished, under some of the most trying circumstances in which human nature is ever placed.

Postscript.—Since the above observations were sent to the press, I have—through the great kindness of Professor Miller and Dr. Duncan—had an opportunity of trying the effects of the inhalation of chloroform, to-day, in three cases of operation in the Royal Infirmary of Edinburgh. A great collection of professional gentlemen and students witnessed the results, and among the number was Professor Dumas of Paris, the chemist who first ascertained and established the chemical composition of chloroform. He happened to be passing through Edinburgh, engaged along with Dr. Milne Edwards, who accompanied him, in an official investigation for the French Government,—and was, in no small degree, rejoiced

to witness the wonderful physiological effects of a substance with whose chemical history his own name was so intimately connected.

I append notes, obligingly furnished to me by Professor Miller and Dr. Duncan, of the three cases of operation. The two first cases were operated on by Professor Miller: the third by Dr. Duncan. In applying the chloroform in the first case, I used a pocket-handkerchief as the inhaling instrument; in the two last I employed a hollow sponge.

Case I.—"A boy, four or five years old, with necrosis of one of the bones of the forearm. Could speak nothing but Gaelic. No means, consequently, of explaining to him what he was required to do. On holding a handkerchief, on which some chloroform had been sprinkled, to his face, he became frightened, and wrestled to be away. He was held gently, however, by Dr. Simpson, and obliged to inhale. After a few inspirations he ceased to cry or move, and fell into a sound snoring sleep. A deep incision was now made down to the diseased bone; and, by the use of the forceps, nearly the whole of the radius, in the state of sequestrum, was extracted. During this operation, and the subsequent examination of the wound by the finger, not the slightest evidence of the suffering of pain was given. He still slept on soundly, and was carried back to his ward in that state. Half an hour afterwards, he was found in bed, like a child newly awakened from a refreshing sleep, with a clear, merry eye, and placid expression of countenance, wholly unlike what is found to obtain after ordinary etherization. On being questioned by a Gaelic interpreter who was found among the students, he stated that he had never felt any pain, and that he felt none now. On being shown his wounded arm, he looked much surprised, but neither cried nor otherwise expressed the slightest alarm."

Case II.—"A soldier who had an opening in the cheek—the result of exfoliation of the jaw—was next made to inhale. At first he showed some signs of moving his hands too freely; but soon, also, fell into a state of sleep and snoring. A free incision was made across the lower jaw, and from this the dense adhering integuments were freely dissected all round, so as to raise the soft parts of the cheek. The edges of the opening were then made raw, and the whole line of incision was brought together by several points of suture. This patient had previously undergone two minor operations of a somewhat similar kind; both of them had proved unsuccessful, and he bore them very ill—proving unusually unsteady, and complaining bitterly of severe pain. On the present occasion, he did not wince or moan in the slightest degree; and, on the return of consciousness, said that he had felt nothing. His first act, when apparently about half awake, was suddenly to clutch up the sponge with which the chloroform was used, and re-adjust it to his mouth, obviously implying that he had found the inhalation from it, anything but a disagreeable duty.

"This case was further interesting as being one of those operations in the region of the mouth, in which it has been deemed impossible to use ether,—and certainly it would have been impossible to have performed the operation with any complicated inhaling apparatus applied to the mouth of the patient."

Case III.—"A young man of about twenty-two years of age, having necrosis of the first phalanx of the great toe, and ulceration of the integuments, the consequence of injury. The ulcerated surface was exceedingly tender to the touch—so much so, that he winced whenever the finger was brought near to it; and the slightest pressure made him cry out. After the removal of the dressings, which caused some pain and fretting, the inhalation was commenced, and the patient almost immediately* became insensible, and lay perfectly still, while the diseased mass was being removed by amputation of the toe through the middle of the second phalanx. The inhalation was now stopped. The edges of the wound were then brought together with three stitches, and the wound dressed. The patient shortly afterwards awoke, looked round him, and gratefully declared his entire and perfect freedom from all pain and uneasiness during the operation."

The whole quantity of chloroform used in these three operations did not exceed half an ounce,—and, as Professor Miller afterwards observed to the students

* Dr. Christison, who was watching the result, informs me that this patient was affected in half a minute.

that were present, if ether had been used, several ounces of it would have been requisite to produce the same amount of anæsthetic effect.

The following case occurred also to-day, to Mr. Miller, in private practice. The notes of it and the subsequent remarks are in his own words.

Case IV.—"A young lady wished to have a tumour (encysted) dissected out from beneath the angle of the jaw. The chloroform was used in small quantity (about a drachm), sprinkled upon a piece of operation sponge. In considerably less than a minute she was sound asleep, sitting easily in a chair, with her eyes shut, and with her ordinary expression of countenance. The tumour was extirpated, and a stitch inserted, without any pain having been either shown or felt. Her sensations, throughout, as she subsequently stated, had been of the most pleasing nature; and her manageableness during the operation was as perfect as if she had been a wax doll or a lay figure.

"No sickness, vomiting, headache, salivation, uneasiness of chest, in any of the cases. Once or twice a tickling cough took place in the first breathings"

I have, up to this date, exhibited the chloroform to about fifty individuals. In not a single instance has the slightest bad result of any kind whatever occurred from its employment.

—

66. [In a paper published in the *Monthly Journ. of Med. Sci.*, for December, Prof. Simpson gives some further particulars in regard to chloroform, which we extract.]

"*Physiological Effects.*—After the first two or three full inspirations, a feeling of warmth and excitation, radiating from the chest to the extremities; followed by whirring noises in the ears; a sensation of vibratory thrilling and benumbing throughout the body; with, betimes, rapid loss of sensation and of motion, and at last of consciousness. Often before total unconsciousness supervenes, the patient, guided by instinct rather than by volition and reason, makes an effort to get rid of the inhaling vapour and handkerchief, as if it interfered with free respiration. During the full anæsthetic sleep produced by chloroform, sometimes no mental action goes on, or at least is remembered; in many others, the mind is active as in dreams. The respiration is usually at first soporose; the pupil sometimes natural, in others slightly contracted, in others dilated; the pulse is usually quickened ten or twenty beats at first, but afterwards falls to its normal rate, and, if the vapour is exhibited very long in very powerful doses, it comes down more and more below the natural standard; muscles of voluntary motion in general relaxed; more rarely cataleptic; still more rarely clonically contracted, as happens also occasionally with ether. In small doses, given slowly, its effects are exhilarating; and exactly like those generally following the inhalation of nitrous oxide gas.

"*Uses in Surgery.*—1. To relax the muscles in reducing dislocations, &c.: 2. To avert the sufferings attendant on deep probing, and other painful but necessary modes of diagnostic examination and dressing; and 3, and principally, to annul the pain of operations by the caustic, ligature, or knife.

"*Uses in Midwifery.*—To diminish and annul the physical pains attendant on labour, and more especially those which accompany the passage of the child's head through the pelvic cavity and outlet, (the second stage of Denman.)

"*Uses in Medicine.*—1. As an *anti-spasmodic;* as in asthma, laryngismus, tetanus, and other spasmodic diseases, &c. I have used successfully the inhalation of ether to arrest the paroxysms of hooping-cough, dysmenorrhea, colic, and the pains attendant on the passage of biliary calculi. In a case of the most severe, at the same time painful, spasmodic twisting and convulsions of the extremities attending a second attack of chorea, I allowed the patient ether inhalation; and sometimes she lay under its influence for hours, with relief while its action lasted, but generally without sleep. Latterly the chloroform has both relieved the spasms and their attendant pain, and procured sleep.—2. As an *anodyne* or *narcotic.* In neuralgia, I have seen chloroform stop the fit at once; in two other cases the pain remained absent only while the chloroform acted. A patient suffering under severe delirium tremens had remained awake for about seventy hours; a half ounce of laudanum, given at a single dose, failed to produce rest; ten hours afterwards, the inhalation of chloroform was immediately followed by several hours of critical sleep. What cases of insanity would it benefit? I have exhibited it in full doses in some cases of dementia, combined with excitement and wakeful-

ness. They were all asleep in about a minute—and remained so for some time. In nothing does chloroform differ from ether more than in its soporific effects—when given in full doses, and continued for some time.—3. In small doses as a *diffusable stimulant;* to arrest the first commencement of ague, ephemera, &c.; in hysteria, &c. Perhaps it may be used by inhalation in small quantities when the stomach will not bear wine or other stimulants; in severe vomiting, fevers, &c. I have seen its inhalation at once dispel a sick headache.

"*Cautions.*—The liquid used should be sufficiently strong. Its proper sp. gr. is (as I have said) 1·480. It is certainly far too powerful an agent to be intrusted to nurses or unprofessional individuals. I have given it, up to this date, to above eighty persons, without the slightest bad result of any kind whatever in any one of them. The power, however, which we have with it, of bringing down the pulse, &c., shows that, if exhibited in too strong a dose, and given *uninterruptedly* for too great a length of time, it would doubtless produce serious consequences, and even death. But, certainly, all its *full* anæsthetic and other influences may be perfectly obtained without allowing it to produce such depression as would be in any degree dangerous. Like many other agents, it may be powerful for evil as well as for good. I believe its great potency will be one great safeguard against its abuse.

"Its influence upon the blood, &c., the counter indications to its use, &c. &c., remain still to be ascertained."

—

67. *The New Letheon Agent.*—At a meeting of the Westminster Medical Society, (Nov. 20th,) Dr. Snow made some remarks respecting chloroform. He said that this agent, which had been introduced by Dr. Simpson, to be inhaled instead of ether, was preferable to the latter in some respects, although it was impossible that anything could be more efficient than ether, as it was capable of totally preventing the pain in every operation in which it might be properly applied. He considered that the action of chloroform on the nervous system was identical with that of ether; by regulating the proportion of vapour in the air, he had produced the same effects on animals by both agents; chloroform, however, had the advantage of being less pungent, and, therefore, less care was required in graduating its first admission to the lungs; it was readily inhaled, and produced its effects with great rapidity, and the quantity of it consumed was curiously small when compared with ether. He had administered it on Thursday, in an amputation of the breast performed by Mr. Tatum, at St. George's Hospital. He gave it with his usual apparatus, the water-bath being 55°, and the quantity of vapour in the air inhaled not more than ten per cent. by measure, yet the patient was ready for the operation to begin in less than a minute, and it was performed without the least sign of pain, being equal to the best cases of etherization. The patient recovered her consciousness, as might have been expected from narcotism by ether to the same degree, and she was going on well. Only one fluidrachm of the material was used, although about ten fluidrachms of ether would probably have been used in the same operation. He (Dr. Snow) had inhaled it until he became unconscious, and was very sick afterwards, as on the only occasion on which he inhaled ether to the same extent. When the full effects of ether could be induced quickly, there was no preliminary excitement, and as the new agent produced its effects very speedily, excitement previous to insensibility could probably be altogether avoided in its use. The chloroform placed on the table had been given to him by Mr. Bullock, the chemist; it had been rectified from chloride of calcium; he (Dr. Snow) found its boiling point to be 140°; he was not aware that the elastic force of its vapour, at other temperatures, had been ascertained; but, from some experiments that he had made, it seemed to follow a ratio very similar to those for ether-vapour and vapour of water; he had ascertained the quantity of vapour of chloroform that air would hold in solution, at various temperatures, and it was shown in a table, of which the following is a copy:—

Quantity that 100 *cubic inches of air will take up.*

Temp.	Cubic inches.	Temp.	Cubic inches.
50°	9	75°	29
55	11	80	36
60	14	85	44
65	19	90	55
70	24		

The quantity of this vapour in the air the patient inhaled at ordinary temperatures was only about a quarter as much by measure as there would be of ether,—being, however, nearly twice as heavy; there was nearly half as much by weight. Now, on account of the small space it occupied, it only excluded the air to a quarter the amount that ether-vapour did, and therefore interfered but little with the natural process of respiration; the patient, indeed, could take in nearly the usual amount of oxygen without quickening or enlarging the respiratory movements. It was to be observed that temperature exerted a great influence over the quantity of this vapour that air would take up, and thus an elevation of little more than fifteen degrees in the warmth of the apartment would double the amount of it which the patient would inhale in a given time, if no means were taken to regulate the evaporation. Dr. Simpson recommended the chloroform to be inhaled from a sponge or handkerchief, and this simple means was efficient; but he (Dr. Snow) preferred to use an apparatus, as, without it, more of the vapour was blown away by the warm breath of the patient than was inhaled. The strength of the vapour could not be regulated; it could not even be known when it was all expended, and no exact observations could be collected. The chloroform was of easier application than ether, on account of its quicker action; but for the same reason, greater care was required in its use to avoid accident.

Dr. F. Bird said that he had seen the chloroform administered that day in two operations, by Mr. Philips, at the Westminster Hospital; it was perfectly successful, and the patients recovered their consciousness very quickly.—*Lancet*, Nov. 27, 1847.

—

68. *Operations performed at St. Bartholomew's Hospital, upon Patients rendered insensible to Pain, by the Inhalation of Chloroform.*—Holmes Coote, Esq., reports (*Lancet*, Nov. 27, 1847) three operations performed by Mr. Lawrence, on patients under the influence of chloroform,—two, lithotomy by the lateral operation, and the third, extirpation of a tumour from the breast. These cases, Mr. Coote says, confirm the favourable report given by Prof. Simpson, of the effects of this agent.

"These three patients," Mr. Coote states, "did not experience the smallest inconvenience from the inhalation into the lungs: the condition into which they were thrown—differing from the state of stupor, which commonly ensues after the inhalation of ether—bore the closest resemblance to profound sleep; they recovered quickly, the smell was speedily gone, and the cases are now going on most favourably.

"Without wishing in any way to detract from the very great merit of Professor Simpson, in introducing this valuable agent, I may observe that for some considerable time Mr. Lawrence has used, in private practice, the chloric ether, which is chloroform in spirit and water. *Patients with irritable lungs, who could not tolerate the violent paroxysms of coughing induced by the sulphuric ether*, readily inhaled the chloric ether, the taste and smell of which are similar to those of chloroform; the anæsthetic effect was more gently induced, and there were fewer complaints, on recovery, of soreness of the chest, headache, &c. The less irritating effect of the chloric ether was noticed by Mr. Taylor, and by myself, in some experiments (reported in this journal) performed upon animals; their efforts to escape were most violent, when immersed in the vapour of sulphuric ether.

"One of the students of the hospital, who in the early part of the year was anxious to have some painful stumps of teeth removed from the jaw, kindly consented to take the ethers upon two different occasions, and to report the result. He described the taste of the chloric ether as much more agreeable than that of the sulphuric; the effect upon the lungs as less irritating and oppressive; but he thought that the state of unconsciousness was not equally complete. Mr. Lawrence

has, however, performed many most severe operations upon patients rendered perfectly insensible to pain by the inhalation of the chloric ether, and he is now in the habit of directing its administration.

"The advantages which the chloroform appears to possess are so numerous and important, that if the results of subsequent trials are equally successful with those here recorded, there is little doubt of its superseding all other known anæsthetic agents. Some modification in the mode of its administration may be requisite, since, as I am informed by Mr. Mitchell Henry, one of the house-surgeons, the lips of two of the patients have been vesicated by the application of the sponge.

[Operations have also been performed, upon patients under the influence of chloroform, by Messrs. Liston, Fergusson, Aston Key, Hancock, Walton and other surgeons in London, and in Paris, by MM. Blandin, Roux, Vidal, and Amussat. The results obtained, are said to be confirmatory of the statements made by Prof. Simpson.]

69. *Chloroform in Midwifery Practice.*—Dr. Protheroe Smith, in a paper in the *Lancet*, (Nov. 27, 1847,) related the following case of labour in which he employed it.

"A lady, aged thirty-seven, of a highly nervous temperament; has been married fourteen years; had, in the first ten years after her marriage, four male and three female children, besides a miscarriage. During the last six years she has occasionally suffered from bearing-down and other symptoms of uterine distress, which were always aggravated by walking, especially so during pregnancy. Menstruation has been somewhat irregular and often scanty. She continued in good health till the evening of the 17th, when she had a sudden and severe pain in the left hypogastrium: she described the sensation as giving her the idea of something being torn from the womb.

"At twenty minutes past three o'clock A. M., on the 18th, a sudden gush of blood and some water occurred, and was followed by slight pains; at eight o'clock these recurred more or less severely about every quarter of an hour or twenty minutes, but remitted towards night. Examination per vaginam at this time discovered the os uteri high up and dilated to about the size of a sixpence; the head presented in the first position; the margin of the os uteri was very uneven and irregularly hard, feeling as though some beads were imbedded in its tissue. The pains became more regular in the evening of the 18th, recurring about every quarter of an hour, but again diminishing in both strength and frequency as night advanced. Towards the morning of the 19th, they became more persistent and came on every quarter of an hour till the evening, when the patient appeared rather exhausted. At this time the head was still above the brim of the pelvis; the os about the size of a shilling, and its edges presenting the peculiarity before mentioned. There had been occasional discharges of blood and liquor amnii. I could not detect any presentation of the placenta. The patient was ordered twenty-five minims of the sedative liquor of opium, which procured her a good night's rest.

"The pains came on again at seven A. M. of the 20th, and continued without interruption about every seven minutes. The os dilated very slowly, leaving the bead-like structure more distinct from the recession of the intermediate tissue. About four P. M., notwithstanding the pains were powerful, the os, which was dilated nearly to the size of an orange, yielded but slowly. I ordered a plentiful injection of hot water per vaginam, soon after which the os dilated more readily, though the anterior lip became œdematous, and was pressed between the head and os pubis.

"At this period of the case, the patient became very urgent for relief, and, with the consent of herself and friends, I began to administer the chloroform, during the terror of a severe pain. The countenance, which before had expressed severe suffering and intense anxiety, immediately relaxed into a placid smile, and in a few inspirations, the patient appeared in a profound sleep, when the inhalation was suspended, but renewed on the recurrence of each uterine effort. The contractions came on at the same intervals as before the inhalation. The os now yielded rapidly, and the membranes which protruded at the os externum

were ruptured. There were two collections of liquor amnii; that which had escaped at twenty minutes past three on the morning of the 18th, (which was between the amnion and chorion,) and the true water, of which I have just spoken.

"A very large male child was born thirty-nine minutes after the commencement of the exhibition of the chloroform. Some coagula accompanied both the child and the placenta. The expulsion of the latter, which was unusually large, followed the child in about three minutes. Consciousness returned in about two minutes after discontinuing the chloroform, when the patient was perfectly calm and tranquil, and observed that she had had "a very refreshing sleep," and was altogether ignorant of the birth of her child. Two drachms of chloroform were used. Some coagula followed the after-birth, but the uterus was felt well contracted under pressure of the hand, and remained so on the application of the abdominal bandage, which I usually employ. No faintness or other unpleasant sensation was experienced, and the pulse, which, during the narcotic state, was 86 and full, was now the same in character, but 96 in number. A dose of ergot of rye was administered, and the child put to the breast, after which, some trifling after-pains were experienced. The patient took some slight refreshment with considerable enjoyment. It is very remarkable, that immediately after every previous labour, this lady had suffered from severe attacks of cataleptiform spasms, in which, at first, the features were extremely distorted, and afterwards the whole body became rigid. This condition was then rapidly followed by sudden flexion of the legs on the abdomen, whilst the knees violently struck against each other, requiring the aid of a strong person to restrain their movements. This state usually lasted some hours, and always recurred on the third day after delivery. In this confinement she has entirely escaped these symptoms, excepting a very slight attack, of an hysterical character, on the morning of the third day, which was instantly relieved by a draught, composed of valeriate of ammonia, Battley's solution, and camphor mixture. During the whole period of her preceding labour she had considerable flooding; and as there had been some loss of blood in the present instance, I deemed it prudent to administer a dose of ergot of rye at the termination of the labour. The after-birth presented on one side a black ecchymosed appearance, to the extent of four inches in length by two in width. This state of the placenta was probably produced by a partial detachment at the time of the sudden pain mentioned in the early part of the case. The average time which had elapsed in her previous labours between the birth of the child and the expulsion of the placenta, was stated to me to be an hour; in this case it was thrown off in three minutes. The protracted nature of the first stage of parturition in this lady, no doubt resulted from the anormal state of the labia uteri before mentioned. I will only add, she has felt no after-pains, excepting those which followed the first application of the child to the breast; and up to this period, Nov. 24th, both the mother and child are doing well."

[The value of Dr. Smith's testimony in favour of the chloroform is, to our mind, impaired by what appears to us an inconsistency in some of the statements in his paper. Thus, after stating that he has reported in the Lancet, cases in which he had exhibited ether, he adds: "*All these cases were perfectly successful, and were neither accompanied nor followed by any unpleasant symptom whatever.*" This result was the more satisfactory and conclusive, as amongst the cases which I published, were placenta prævia (four), severe floodings, turning, perforation, cases requiring both the long and short forceps, adherent placenta,—in short, some of the most formidable exigencies which the obstetric practitioner is called upon to meet." On the very same page, in enumerating "the advantages which chloroform possesses over ether," he mentions among others, "*the absence of the stage of excitement or stimulation, which almost invariably attends ether, and sometimes to an inconvenient extent. The greater rapidity and certainty with which the patient is brought under its influence.*" Chloroform does not leave any disagreeable odour about the breath or clothes, of patient or operator. "*No headache or other unpleasant effects are left behind.*" We leave it to Dr. Smith to reconcile these statements. Until he does so, we must be permitted to doubt the sincerity of his eulogy on his former hobby, since he is so ready to abandon it for a new one, and especially when he dismisses the former with so hard a kick, the moment he is fairly astride the latter. Dr. Smith is not singular in this conduct as will be seen presently.]

70. *Chloroform in severe Childbirth.*—The following case is related by Mr. Brown, Consulting Accoucheur to the Paddington Lying-in Charity.

Mrs. W——, aged forty, the mother of seven children, sent for me at half-past five, A. M. She had had labour-pains since one, A. M. I found the os uteri dilated to the size of a crown-piece, but all the external parts dry and tense, the liquor amnii having been discharged many hours previously. The pains were severe, and not very efficient, being checked in their progress by the funis, which was found subsequently to be round the neck and left arm. I proceeded to administer the chloroform, by placing a small quantity on a pocket-handkerchief, and allowing her to breathe it. In half a minute it produced an agreeable state of stupor, and she suffered but little from the next pain. I paid great attention to the practical and judicious remarks which Dr. Simpson kindly gave me, in a private note accompanying his pamphlet—viz: "In midwifery you do not require to keep the patient so *sound* and deep as in surgery, otherwise you will stop the pains; but she should be *so* deep as not to feel them. With chloroform I give a few inhalations before each pain. In the interval, keep her just asleep, and no more." Thus I found every pain subdued as to the patient's suffering, but not at all as to its expulsive power. After the first two or three inhalations the external parts gave way, and became moist, soft, and yielding. The head, which did not present in the natural way, but with the ear under the arch of the pubes, and the occiput under the sacro-sciatic arch, in about two hours descended to the perineum, and pressed hard upon it. I then gave a larger dose, and the child—a fine male—was born without the knowledge of the patient, and she awoke in five minutes, hearing its cry. The placenta came away entire in ten minutes, whereas in all her previous labours she had always either hour-glass contraction, or retention from other causes. The uterus contracted well, and continued so; the patient had no bad symptom, either vomiting or headache. In all, I used only *one* drachm. —*Lancet*, Dec. 4th, 1847.

—

71. *Chloroform in Instrumental Labour.*—Prof. Murphy mentioned, at a meeting of the Westminster Medical Society, (Nov. 27,) that he had lately exhibited the chloroform in a case of perforation, occurring in a woman with a deformed pelvis, and in whom no other operation could have been resorted to for delivery. Dr. Snow had, in this case, exhibited the agent, and though the operation lasted for three-quarters of an hour, she was quite unconscious during the whole time, and when she awoke at the conclusion of the operation, expressed her surprise at her delivery. She had undergone the operation before, and had suffered greatly, the consequences of the proceeding being felt by her for the space of three months afterwards, so that she could not leave her bed. In the present instance the operation had been performed only two days since, and she was now nearly well. —*Lancet*, Dec. 4th, 1847.

—

72. *Chloroform in Medical Practice.*—At the meeting of the Westminster Medical Society, Mr. Brown stated that he had recently employed it as a remedial agent in a case of bronchitis in a lady about fifty, in whom, after the acute symptoms had been removed by appropriate treatment, great restlessness and sleeplessness, with some cough, presented themselves. These were so urgent, that for three nights she obtained no sleep whatever. She could not bear any kind of opiate. Under these circumstances, he placed half a drachm of chloroform in a sponge to her nostrils. It took almost immediate effect, and she had two hours of most refreshing sleep. Restlessness, however, returned on awaking, and continued for some hours; but since then she has had good nights, and is free from the symptoms mentioned.

Mr. Greenhalgh had, the day before, exhibited the chloroform in the way recommended by holding it to the nose in a sponge. The patient was a gentleman, who was the subject of severe attacks of spasmodic asthma, which usually were of some duration, and from the effects of which he did not usually recover under two or three days. In this attack he administered forty minims of the chloroform. The patient almost immediately fell into a profound sleep, from which he awoke without any of the usual consequences of the attack. So pleased was he with the effect of the remedy, that he now kept a dose of the preparation in readiness to

inhale if an attack came on. He (Mr. Greenhalgh) had employed chloroform in a great number of cases, and had himself frequently inhaled it. It had the advantage over ether of being more easily applied, producing no excitement, being more rapid in its action, and leaving none of the unpleasant sensations behind it which ether did.—*Lancet*, Dec. 4th, 1847.

—

73. *Ether in Surgical Operations.*—Prof. Syme in an article on this subject in the *Monthly Journ. Med. Sci.* of August last, remarks:—

"Whilst discharging what I conceive to be my duty in offering this testimony as to the safety and efficiency with which ether may be administered, I am very far from desiring to sanction its indiscriminate employment, or attaching to it the importance that has been so much insisted upon by some popular writers. In an inflated article of 'the North British Review,' obviously written more with a view to make an impression upon the non-medical part of the public, than to convey useful information—the author, with greater credit to his plausibility than sincerity, if, indeed, he really possessed any surgical knowledge or experience, has not scrupled to magnify the value of an influence causing insensibility, or forgetfulness of suffering, by greatly exaggerating the pain of operations, and misrepresenting the effect of its suspension upon their performance. Physical pain is undoubtedly an evil, but certainly one of very secondary importance when compared with any want of perfection in attaining the object for which an operation is performed. It may be added, that the pain of trivial operations, such as the extraction of a tooth, or the evulsion of a nail, would form a very erroneous standard for estimating the amount of what is felt on the occasion of more extensive mutilations. I have frequently, in operating at the hospital, called attention to the perfect quiet and composure of patients under the greatest liberties ever taken with the human frame, such as the removal of large tumours, amputations, and lithotomy. On many of these occasions not one cry or groan, or even any alteration of the breathing, not a movement of the body, or contortion of the countenance could be noticed; and the patients, when asked to describe their sensations, have represented them as nowise unbearable.

"But however severe the pain really were, it would still be of little consequence when compared with the effects of the operation; and the patient, upon awakening from his ethereal trance, would be sorry to learn that immunity from suffering had been obtained at the expense of unnecessary injury to his body. It has been said, indeed, by the reviewer, that the ether, so far from impeding the proper performance of operations, will greatly promote it, by freeing the surgeon from a powerful inducement to hurry through their steps, instead of taking them with care and deliberation. But surely, though this argument might suffice for "*vulgus captandum*" purposes, it could not for an instant impose upon any member of the surgical profession. Operations performed quickly are in general performed well, not *because* of the short time they occupy, but in consequence of nothing more being done by them than what is actually required; while slow operations are in general ill-performed, not by reason of their slowness, but from the unnecessary groping, squeezing, cutting, and tearing required for their completion. If a surgeon can perform an operation properly, he will not render his work more perfect by protracting its execution; and if he cannot duly discharge his duty on a patient who retains sensibility, he will find himself no less unable to do so in operating upon one stupefied by ether.

In many operations it is of the utmost importance that the patient should retain a voluntary control over his movements, not only for assisting the operator by executing those that he may desire, but by abstaining from those which would be obstructive of the object in view. Thus I have known the little operation for fistula in ano not only impeded but prevented by the convulsive efforts induced through the use of ether. In all careful dissections, as those for hernia, and the removal of tumours from intricate connections of importance, I would therefore advise against the inhalation. I lately disarticulated a clavicle from the sternum, for osteo-sarcoma, and dissected out some large deep-seated tumours of the neck, with results which, I believe, might not have proved so satisfactory if ether had been used. In operations affecting the nose and mouth, also, I should think it inexpedient to render the patient insensible; lest from the want of voluntary

effort, suffocation, or an approach to it, might arise from the entrance of blood into the air passages. Finally, I beg to warn against administering the ether to persons in a state of great weakness or exhaustion. About a week ago I performed amputation of the thigh on a young man brought into the hospital from the neighbourhood of Kirkcaldy, where, seven hours before the time of his admission, his leg had been completely shattered by a railway carriage. There was no sign of reaction, or promise of any from delay, and I therefore proceeded to remove the limb. Upon the incisions being made, relaxation of the sphincters took place, the contents of the rectum and bladder were voided, and an effort at vomiting seemed the prelude of immediate dissolution. Before tying the arteries, I waited to ascertain whether the condition of the patient depended upon syncope or death. My colleague, Dr. Duncan, by causing alternate pressure and relaxation of the chest, effected artificial respiration for some time without any sign of returning life. But by and by the actions of the system were gradually restored, and maintained through the use of stimulants. The wound has healed by the first intention, and the patient now seems to be in a fair way of recovery, which he most certainly would not have been if the vital powers had been in the slightest degree lowered or impeded in their operations by the use of ether."

—

74. *Remarks on the Inhalation of Ether in One Hundred and Six Cases.*—Mr. Wells of the English Navy, gives the following as the result of one hundred and six cases in which he used ether vapour:—

The operations were—amputation of arm, 1; amputation of parts of hand, 4; lithotrity, 1; excision of tumours, 4; removal of polypi, 2; of inverted nails, 3; of necrosed bone, 1; opening and emptying ovarian cyst, 1; strabismus, 15; incisions for various purposes, as dividing fistulæ, opening sinuses, &c., 13; extraction of teeth, 59. I also applied the vapour in a case of hydrophobia, and in one of suspected malingering.

Effects.—No serious ill effects followed in any case. In only one was uneasiness excited; this was a little girl, who although not more than a minute under the influence, suffered from vomiting and faintness for nearly an hour, and remained for eight hours in a state of complete intoxication. The operation being only that for the cure of strabismus, could not have induced any such condition. In three delicate women, hysteric laughing and crying followed, but never lasted more than a few minutes. One young lady appeared to be in a profound sleep for four hours, but on recovery said, she had been quite sensible of everything that had occurred during all this time, although she was quite incapable of either speaking or moving. In no male was any ill effect observed. The wounds in every case presented a healthy appearance, and the processes of granulation and cicatrization were apparently in no way affected by the etherization of the patient. In nine cases, the inhalation was discontinued on account of suffocative feelings or convulsive motions of the patient; in fifty-two, the persons either cried, started, or moaned during the operation, but, on recovery, said they had felt no pain, although, in fourteen instances, they were conscious of what was being done; in forty-five, the success was complete, the patients giving no sign of sensibility during the operation, and on recovery, appearing quite ignorant that anything had been done. The sensations described by different persons were extremely various; generally there was some heat in the mouth and difficulty of breathing, followed by vertigo and conscious loss of muscular power preceding insensibility. By some, pleasant dreams, indescribable but delightful sensations, rapid flights through the air, gorgeous visions, and unearthly music, were described in glowing language; by a few others, a sense of great oppression, resembling nightmare, was complained of; in many others as total a temporary suspension of all the mental faculties and cerebral functions had taken place, as in the most profound sleep, nothing being remembered after the few first inhalations, until the period of returning consciousness. In those cases, where flushing of the face, turgescence of the neck, or convulsive motions, led to a discontinuance of the inhalation, nothing more than difficulty of breathing was complained of.—*Lond. Med. Gaz.*, Sept. 1847.

—

75. *Ether in Dislocation*—Mr. Dehane records (*Prov. Med. and Surg. Journ.*,

Sep. 8th) a case of dislocation of the hip, into the foramen ovale, in a strong muscular man, reduced the day after the accident. "The patient did not appear to suffer much pain, although great force was gradually exerted for its reduction, and he had the appearance of a person partially tipsy, and continued to talk and laugh throughout the operation."

—

76. *Ether in Traumatic Tetanus.*—In a lecture recently published in the *London Medical Gazette*, Mr. B. Cooper details the history of a case of traumatic tetanus, in which ether was employed. The subject of it was a boy admitted to Guy's Hospital for a lacerated wound of the hand. On the twelfth day, the patient was seized with symptoms of tetanus. Amongst other remedies, ether was administered, and was followed by temporary relief, but the spasms recurred, and he died on the sixth day from the first appearance of the tetanic symptoms.

Dr. Crawford records (in the *British American Journ. Med. and Phys. Sci.*, Dec. 1847), a case of traumatic tetanus in which he employed ether inhalation. Two ounces of the ether were inspired, which induced a very transient sleep, and some incoherent raving, but no relaxation of the spasms, although the inhalation was continued for about twenty minutes. The case terminated fatally.

Dr. T. L. Ogier has also recorded (*Southern Journ. of Med. and Pharm.*, Nov., 1847) a case of traumatic tetanus in which the inhalation of ether moderated the violent muscular contractions but did not prevent a fatal termination of the disease.

—

77. *Ether in Hydrophobia.*—Mr. Allen records (*Lancet*, Oct. 16th), a case of hydrophobia, in which the spasms were temporarily relieved by the inhalation of ether, without, however, preventing a fatal termination.

—

78. [*Injurious Effects of Ether.*—Success is speedily heralded, whilst most persons hesitate to admit that they are less fortunate than their neighbours. Such has always been strikingly the case in regard to new remedies and novel surgical procedures, and this should be borne in mind, in estimating the value of the evidence *first adduced* in favour of any medicine or operation. Several hundreds of cases have now been recorded, in which ether has been successfully employed, while but few have been brought forward, in which it was productive of injurious consequences. It is a marvel which we confess being unable to solve, (except on the principle alluded to above,) that an agent so potent as ether, should have been administered in so many cases, often recklessly and by inexperienced persons and so seldom with ill effects, as far, at least, as published statements enable us to judge. Some few instances, however, of supposed injurious effects from ether have been recorded, and others have been indirectly hinted at: some of these we shall now notice.]

Prof. Murphy, at the meeting of the Westminster Medical Society, (Nov. 20,) said that he had only employed the inhalation of ether in extraordinary cases, because he found that it caused excitement both before and after insensibility, and he dreaded the occurrence of hemorrhage at such times. He had known ether to cause spasms resembling the access of puerperal convulsions. (*Lancet*, Nov. 27.) At a subsequent meeting (Nov. 27) of the same society, after relating a case in which he had used chloroform, he observed, that when, in other obstetric cases, he had administered ether, he had been dissatisfied with the manner in which the patients recovered from its effects; the state which they then exhibited was similar to half-drunkenness. Had flooding occurred, under these circumstances, he should have been apprehensive of the result. After the use of chloroform the patient awoke quite tranquil.

Mr. Hancock, after mentioning (*Ib.*) two cases of strangulated hernia in which he had operated, the patients being placed under the influence of chloroform, and in which the effects were most satisfactory: the patients awoke calm and collected. He added, "when ether was given, he had found patients awake in an excited state."

Mr. Barnard Holt also stated (*Ib.*) "that he had seen chloroform employed in several cases; in all of them it had produced violent convulsions."

79. *Hurtful Effect of Etherization in an Operation upon a Gunshot Wound.* By Mr. Lawrence, of Montrose.—As every fact bearing upon the subject of etherization is at present interesting, I make no apology for troubling you with the following brief statement:—

On the 27th ult., E. C., a boy 16 years of age, while firing off a pistol received a part of its contents into the thumb of his left hand, by which fully one-half of its second phalanx was carried away. He was brought to my surgery immediately after, and before proceeding to remove the remaining portion of the phalanx at the articulation, I employed the inhalation of ether in the usual manner. About a minute sufficed to bring him so much under its influence as to permit the necessary incisions without struggling, though not without cries. After sponging the stump, and while seizing the needle to secure the flap by a stitch, he awoke so far to a perception of what was passing, as urgently to request more of the ether to prevent him "feeling the pain." After a few deep draughts of the vapour, the narcotic effect was so powerfully produced, that the needle was thrust through the flap and the skin on the opposite side without the least manifestations of suffering. In a minute or two after, on being spoken to, consciousness returned; but scarcely had he expressed surprise at what had been done, when he was seized with a severe *epileptiform fit*, by which his whole body was violently agitated, and his face rendered turgid and distorted. On being laid in the recumbent posture, and having fresh air freely supplied, he soon recovered, but felt much exhausted, and declared he had (while under the ether) been dreaming he was in a deep pit, from which he thought he would never be extricated. He was shortly after able to walk home. Next day he was perfectly well, and has continued so; and the wound is healing satisfactorily.

The recorded cases wherein the employment of ether inhalation has been attended with injurious or unpleasant results seem to range themselves under two classes:—First, in a certain, and probably much the larger proportion, the unfortunate phenomena have been such as practitioners have been accustomed to observe occasionally in similar circumstances, before the inhalation of ether was thought of; and while this by no means *dis*proves the agency of ether in their production, it ought to prevent the "*post quod ergo propter quod*" mode of reasoning into which we are so readily betrayed. Secondly, in a limited number the unfortunate sequences have been such as could hardly be accounted for, otherwise than by a reference to ether as their immediate cause. To the latter class, I apprehend, belongs the case now narrated. The boy had never previously had a fit, and neither the injury received, nor the subsequent operative procedure, can with much plausibility be regarded as the *direct* agent in the production of the one referred to. But the question may be asked, is it likely that the injury (being a contused lacerated wound, involving nervous and tendinous structures) had *predisposed* to the occurrence of the fit? The affirmative is perhaps not altogether a gratuitous assumption. It is well known that such accidents are often the cause of traumatic tetanus, at times following pretty closely upon their occurrence. Is it, therefore, a departure from sober theorizing to suppose, that in this instance there had been produced upon the nervous centres such a degree of that specific morbid impression which in certain circumstances issues in tetanus, as proved adequate, under the superadded influence of the ether, to occasion the paroxysm referred to? From one such case, and even from several, it were obviously unsafe to draw a decided inference; but the gradual accumulation of such facts will, by-and-by, afford the requisite data whence the desiderated laws of the influence of ether may with some certainty be determined. Meanwhile, this much may be averred, that *facts*, no less than the spirit of true philosophy, rebuke, on the one hand, that scepticism which would reject *in toto* the use of this potent agent, because in some cases unpleasant results have attended it; and, on the other, that false confidence in its virtues which asserts, that under no circumstances can its employment prove injurious.—*Month. Journ. Med. Sci.*, Oct. 1847.

—

80. *Ether Inhalation—Death.*—On July 10th, at the Hôtel Dieu of the city of Auxerre, a man, aged fifty-five, of a robust constitution, was placed under the influence of ether, for the purpose of undergoing an operation for the removal of a cancerous tumour. After an inhalation of two or three minutes, considerable

agitation was observed in the face and limbs; during five minutes more, the inhalation was continued, and complete insensibility was established. The first incision was performed; but the dark colour of the countenance having attracted the operator's attention, the pulse was felt, and the patient almost immediately expired. On dissection, the brain, lungs, and heart, the liver, kidneys, and spleen, exhaled a strong smell of ether; the blood was dark and viscid, and the lungs were, in their posterior parts, the seat of hypostatic congestion.—*Med. Times*, Nov. 20, from *Journal des Connaiss. Med.-Chirurg.*

81. *Ether Inhalation.*—The able editor of the *Monthly Journal of Med. Sci.*, in his Number for December last, observes:

"Our readers will remember, that when ether was first introduced, we pointed out that dangerous effects sometimes resulted from its use in certain individuals. These effects, we now know, were entirely owing to the imperfect apparatus, and want of skill employed in its administration. They were not, however, on that account, less dangerous; and a want of proper precautions with the new agent, inasmuch as its power is much more intense, will certainly lead to even greater mischief. In many persons, however, we are bound to say, very grave symptoms have been only hazardous in appearance. We have seen it produce stertorous breathing, foaming at the mouth, tetanic rigidity, and rapid and alarming fall of the pulse; and yet such individuals have recovered as well, and with as little inconvenience, as those who have been thrown into a tranquil sleep. Whilst, therefore, such symptoms should induce extreme caution, observation hitherto has not demonstrated that they are really dangerous."

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

82. *Infanticide in China.*—With respect to the commonly received reports of infanticide among the Chinese, there can be no doubt, Mr. Smith (deputed by the Church Missionary Society) took special care, personally, to inquire into this fact. It is practised chiefly among the poorer classes, and it is the female infants who suffer; a poor man, in his old age, usually receiving support and assistance from his sons, whereas his daughters are generally married early, and are then no longer considered as part of the family. On repeated occasions, and before a numerous assemblage, fathers, when questioned by Mr. Smith regarding this subject, seemed to have no hesitation in openly and simply avowing the fact. He was told that, in the province of Fokeen, at a place called Kean Yingchou, five days' journey above Canton, there were computed to be from 500 to 600 infanticides in a month. The comparative infrequency of the practice at Canton arose from the establishment, by government, of a foundling hospital there, where 5000 female children of the lowest classes, were annually received. While visiting some of the villages in the vicinity of Amoy, the subject of infanticide was introduced to the people. They stated that out of six daughters, it was customary to kill three. Some murdered four, and a few even five, out of the same number. They said that the proportion of female children which they put to death, entirely depended on the poverty of the individual. They said that the death of the infant was effected immediately after birth, and that four different modes of infanticide were practised amongst them; drowning in a vessel of water, pinching the throat, stifling by means of a wet cloth over the mouth, and choking by a few grains of rice placed into the mouth of the infant. If sons were alternately interspersed with daughters in a family, the people esteemed it good luck, and were not accustomed to murder the female children. One old man who was questioned, confessed publicly before the crowd, that out of six daughters, he had murdered three. He said that he smothered them by putting grass into their mouth. The people, perceiving the disgust and indignation which the recital of these facts caused, at last became ashamed of their conduct, showing how easily the conscience may be awakened to the enormity of such actions. In the other parts of China, visited by Mr. Smith, no well authenticated cases were brought within his

notice, sufficient to prove that this crime prevailed to any considerable extent. In the vicinity of Shang-hai and Ning-po, the moral atrocity, if perpetrated, lurks in secret, and is comparatively too rare an occurrence to be regarded as possessing the sanction of public opinion.—*North British Review*, Aug., 1847. T. R. B.

—

83. *Opium Smoking.*—Another prominent vice of the Chinese is opium smoking. This to no certain extent has been practised for a long period, but of late years has increased. An opium house in Amoy is thus described by Mr. Smith.

"The first opium house which we entered was situated close to the entrance to the Taou-lais palace. Four or five rooms, in different parts of a square court, were occupied by men stretched out on a rude kind of couch, on which lay a head pillow, with lamps, pipes, and other apparatus for smoking opium. In one part of the principal room, the proprietor stood, with delicate steelyards, weighing out the prepared drug, which was of a dark, thick, semi-fluid consistency. A little company of opium smokers, who had come hither to indulge in the expensive fumes, or to feast their eyes with the sight of that which increasing poverty had placed beyond their reach, soon gathered around us, and entered into conversation. They formed a motley group of sallow, sunken cheeks, and glassy, watery eyes, as, with idiotic look and vacant laugh, they readily volunteered information, and described the process of their own degradation. There was to be seen the youth, who, just emerging from boyhood, had only commenced the practice a little time before, and was now hastening to a premature old age. There was the man of middle age, who for half his life, a victim of this pernicious indulgence, was bearing with him to an early grave, the wreck of his worn-out constitution. There was, again, the more elderly man, whose iron strength of frame could better ward off the slow, but certain advance of decrepitude, but whose bloated cheek and vacant stare told of the struggle that was raging within. There was, again, the rarely seen spectacle of old age, and the man of sixty lived yet to tell of forty years consumed in the seduction of this vice. They all assented to the evils and sufferings of their course, and professed a desire to be freed from its power. They all complained of loss of appetite—of the agonizing cravings of the early morning—of prostration of strength, and of increasing feebleness, but said that they could not gain firmness of resolution to overcome the habit. They all stated its intoxicating effects to be worse than those of drunkenness, and described the extreme dizziness and vomiting which ensued so as to incapacitate them for exertion. I subsequently visited about thirty other opium shops in different parts of the city. The people say that there are nearly a thousand such establishments in Amoy."

A confirmed opium smoker generally consumes daily about a mace of opium, which is equal to one drachm, or sixty grains, the price of which is about eight pence sterling, a large sum of money in China. In fact many of the poorer classes consume from a third to a fourth of their whole earnings in this pernicious practice.

Drunkenness does not appear to be a prevailing vice among the Chinese. In general, the people are temperate both in eating and drinking.—*Ibid.* T. R. B.

—

84. *A Case of Poisoning by Vinegar.* By A. H. David, M. D., Montreal.—A widow woman, with four children, took, as near as I could ascertain, a quart bowl full of common vinegar. It appears that she had been dull and low spirited for two or three days previous, in consequence of the neglect (as her friends suppose), of a person from whom she had received the most marked attention, and to whom she had been attached prior to her marriage with her late husband. When I saw her, about three hours after she had taken the vinegar, she was in bed, covered with a cold perspiration, trembling from head to foot, and apparently alarmed at every body, and everything around her. Her breathing was very laborious and hurried; her countenance perfectly wild, and the pupils dilated; the tongue was dry and cold; pulse 96 and full; the abdomen much distended, with extremely acute pain at the *scrobiculus cordis*, so much so, that the slightest pressure there, caused her to shriek out. She did not know any one about her, not even her own children, nor had she any recollection of anything that had happened, from the

time of taking the vinegar, which was about eleven o'clock at night, not even of her having gone to bed, which she was the last in the house to do. About one o'clock, the inmates were all awakened by her shrieking for cold water, of which she had drunk an enormous quantity, before I was called to see her. There was not any pain, heat, or constriction of the throat and fauces, but there were slight efforts to vomit. Having procured some sulphate of zinc, I gave her two scruples in a cup of water, which soon produced full vomiting, with great straining. I had then to leave her, but ordered full and repeated doses of carbonate of magnesia, till I could see her again, which I did about six hours after, and found her much relieved, and only complaining of headache, which left her after the operation of a dose of castor oil. Two days after, she was taken ill with a slight attack of continued fever, but is doing well.

Dr. David will find, that Taylor, in the last edition of his *Manual of Medical Jurisprudence*, quotes the case of Orfila, in which a female lost her life by taking strong vinegar.—*British American Journal of Medical Science*, September, 1847.

T. R. B.

—

85. *A New Method of distinguishing between Arsenical and Antimonial Spots.*—M. Cottereau, jun., proposes the following: Let the spots, obtained on porcelain capsules, be exposed to the vapour of phosphorus, and for this, place small fragments of the phosphorus on a flat surface, and hold over it the capsule bearing the spots. The process is accomplished at the ordinary temperature. All the arsenical spots disappear in the course of a few hours, while those of antimony resist the effect for a period longer than even fifteen days. Finally, however, they disappear at least in part; and if, at the end of this time, the capsules be held over a cup containing sulphuretted hydrogen in solution, the emanations from that gas will reproduce the spots; those of the arsenic being in the state of its yellow sulphuret, and those of antimony, of its red sulphuret. All these spots present precisely the form they originally had.—*Encyclographie*, from *Gazette Médicale de Paris*, 1846.

T. R. B.

—

86. *Poisoning by Strychnine.*—The following case by Dr. Theinhart, presents a remarkable example of the characteristic symptoms of this poison.

A student of pharmacy, of intemperate habits, on returning from a ball, where he had danced much and drank much, went to bed, and immediately afterwards swallowed a certain quantity of strychine. On the arrival of Dr. Theinhart, in about quarter of an hour after he had swallowed the poison, he confessed that he had taken nearly two grammes (thirty grains) of strychnine, dissolved in alcohol.

He was lying tranquil in bed, with a natural skin and pulse, and indeed his appearance was such, that Dr. T. refused to believe that the poison had been taken, although this was repeatedly asserted by the patient. Meanwhile, convulsive motions commenced over the whole system, the respiration was quickened, and the convulsions were succeeded by stiffness of the whole body. An emetic was given to check this, but without effect. At the end of a few minutes, a more violent general spasm came on, followed by a third and a fourth one, during which the patient uttered horrible cries. In half an hour, he was dead.

The tongue, gums and lips were violet coloured. So also were the fingers and toes. The first were convulsively retracted, and the last drawn in. The whole body was as rigid as a stick of wood, and slightly bent on itself.

During the slight intervals of consciousness, no satisfactory account could be obtained as to his sensations in the seat of the pain, which nevertheless was evidently felt in the region of the stomach. The neighbours heard loud cries before the arrival of the physician.—*Ibid.* from the *Gazette Médicale.*

T. R. B.

—

87. *Joanna Southcott.*—I copy from a magazine, published in 1815, the following certificate of the examination of the body of this female, who had numerous followers in her day in England, and who, for a long time, declared herself pregnant of a child that was to be the *Saviour of the world.* Her deluded disciples did not abandon the belief until death took her from them.

"We, the undersigned, present at the dissection of Mrs. Joanna Southcott, do

notice, sufficient to prove that this crime prevailed to any considerable extent. In the vicinity of Shang-hai and Ning-po, the moral atrocity, if perpetrated, lurks in secret, and is comparatively too rare an occurrence to be regarded as possessing the sanction of public opinion.—*North British Review*, Aug., 1847. T. R. B.

—

83. *Opium Smoking.*—Another prominent vice of the Chinese is opium smoking. This to no certain extent has been practised for a long period, but of late years has increased. An opium house in Amoy is thus described by Mr. SMITH.

"The first opium house which we entered was situated close to the entrance to the Taou-lais palace. Four or five rooms, in different parts of a square court, were occupied by men stretched out on a rude kind of couch, on which lay a head pillow, with lamps, pipes, and other apparatus for smoking opium. In one part of the principal room, the proprietor stood, with delicate steelyards, weighing out the prepared drug, which was of a dark, thick, semi-fluid consistency. A little company of opium smokers, who had come hither to indulge in the expensive fumes, or to feast their eyes with the sight of that which increasing poverty had placed beyond their reach, soon gathered around us, and entered into conversation. They formed a motley group of sallow, sunken cheeks, and glassy, watery eyes, as, with idiotic look and vacant laugh, they readily volunteered information, and described the process of their own degradation. There was to be seen the youth, who, just emerging from boyhood, had only commenced the practice a little time before, and was now hastening to a premature old age. There was the man of middle age, who for half his life, a victim of this pernicious indulgence, was bearing with him to an early grave, the wreck of his worn-out constitution. There was, again, the more elderly man, whose iron strength of frame could better ward off the slow, but certain advance of decrepitude, but whose bloated cheek and vacant stare told of the struggle that was raging within. There was, again, the rarely seen spectacle of old age, and the man of sixty lived yet to tell of forty years consumed in the seduction of this vice. They all assented to the evils and sufferings of their course, and professed a desire to be freed from its power. They all complained of loss of appetite—of the agonizing cravings of the early morning—of prostration of strength, and of increasing feebleness, but said that they could not gain firmness of resolution to overcome the habit. They all stated its intoxicating effects to be worse than those of drunkenness, and described the extreme dizziness and vomiting which ensued so as to incapacitate them for exertion. I subsequently visited about thirty other opium shops in different parts of the city. The people say that there are nearly a thousand such establishments in Amoy."

A confirmed opium smoker generally consumes daily about a mace of opium, which is equal to one drachm, or sixty grains, the price of which is about eight pence sterling, a large sum of money in China. In fact many of the poorer classes consume from a third to a fourth of their whole earnings in this pernicious practice.

Drunkenness does not appear to be a prevailing vice among the Chinese. In general, the people are temperate both in eating and drinking.—*Ibid.* T. R. B.

—

84. *A Case of Poisoning by Vinegar.* By A. H. DAVID, M. D., Montreal.—A widow woman, with four children, took, as near as I could ascertain, a quart bowl full of common vinegar. It appears that she had been dull and low spirited for two or three days previous, in consequence of the neglect (as her friends suppose), of a person from whom she had received the most marked attention, and to whom she had been attached prior to her marriage with her late husband. When I saw her, about three hours after she had taken the vinegar, she was in bed, covered with a cold perspiration, trembling from head to foot, and apparently alarmed at every body, and everything around her. Her breathing was very laborious and hurried; her countenance perfectly wild, and the pupils dilated; the tongue was dry and cold; pulse 96 and ful[l]; the abdomen much distended, with extremely acute pain at the *scrobiculus cordis*, so much so, that the slightest pressure there, caused her to shriek out. She did not know any one about her, not even her own children, nor had she any recollection of anything that had happened, from the

time of taking the vinegar, which was about eleven o'clock at night, not even of her having gone to bed, which she was the last in the house to do. About one o'clock, the inmates were all awakened by her shrieking for cold water, of which she had drunk an enormous quantity, before I was called to see her. There was not any pain, heat, or constriction of the throat and fauces, but there were slight efforts to vomit. Having procured some sulphate of zinc, I gave her two scruples in a cup of water, which soon produced full vomiting, with great straining. I had then to leave her, but ordered full and repeated doses of carbonate of magnesia, till I could see her again, which I did about six hours after, and found her much relieved, and only complaining of headache, which left her after the operation of a dose of castor oil. Two days after, she was taken ill with a slight attack of continued fever, but is doing well.

Dr. David will find, that Taylor, in the last edition of his *Manual of Medical Jurisprudence*, quotes the case of Orfila, in which a female lost her life by taking strong vinegar.—*British American Journal of Medical Science*, September, 1847.

T. R. B.

—

85. *A New Method of distinguishing between Arsenical and Antimonial Spots.*—M. Cottereau, jun., proposes the following: Let the spots, obtained on porcelain capsules, be exposed to the vapour of phosphorus, and for this, place small fragments of the phosphorus on a flat surface, and hold over it the capsule bearing the spots. The process is accomplished at the ordinary temperature. All the arsenical spots disappear in the course of a few hours, while those of antimony resist the effect for a period longer than even fifteen days. Finally, however, they disappear at least in part; and if, at the end of this time, the capsules be held over a cup containing sulphuretted hydrogen in solution, the emanations from that gas will reproduce the spots; those of the arsenic being in the state of its yellow sulphuret, and those of antimony, of its red sulphuret. All these spots present precisely the form they originally had.—*Encyclographie*, from *Gazette Médicale de Paris*, 1846.

T. R. B.

—

86. *Poisoning by Strychnine.*—The following case by Dr. Theinhart, presents a remarkable example of the characteristic symptoms of this poison.

A student of pharmacy, of intemperate habits, on returning from a ball, where he had danced much and drank much, went to bed, and immediately afterwards swallowed a certain quantity of strychine. On the arrival of Dr. Theinhart, in about quarter of an hour after he had swallowed the poison, he confessed that he had taken nearly two grammes (thirty grains) of strychnine, dissolved in alcohol.

He was lying tranquil in bed, with a natural skin and pulse, and indeed his appearance was such, that Dr. T. refused to believe that the poison had been taken, although this was repeatedly asserted by the patient. Meanwhile, convulsive motions commenced over the whole system, the respiration was quickened, and the convulsions were succeeded by stiffness of the whole body. An emetic was given to check this, but without effect. At the end of a few minutes, a more violent general spasm came on, followed by a third and a fourth one, during which the patient uttered horrible cries. In half an hour, he was dead.

The tongue, gums and lips were violet coloured. So also were the fingers and toes. The first were convulsively retracted, and the last drawn in. The whole body was as rigid as a stick of wood, and slightly bent on itself.

During the slight intervals of consciousness, no satisfactory account could be obtained as to his sensations in the seat of the pain, which nevertheless was evidently felt in the region of the stomach. The neighbours heard loud cries before the arrival of the physician.—*Ibid.* from the *Gazette Médicale.*

T. R. B.

—

87. *Joanna Southcott.*—I copy from a magazine, published in 1815, the following certificate of the examination of the body of this female, who had numerous followers in her day in England, and who, for a long time, declared herself pregnant of a child that was to be the *Saviour of the world.* Her deluded disciples did not abandon the belief until death took her from them.

"We, the undersigned, present at the dissection of Mrs. Joanna Southcott, do

notice, sufficient to prove that this crime prevailed to any considerable extent. In the vicinity of Shang-hai and Ning-po, the moral atrocity, if perpetrated, lurks in secret, and is comparatively too rare an occurrence to be regarded as possessing the sanction of public opinion.—*North British Review*, Aug., 1847. T. R. B.

83. *Opium Smoking.*—Another prominent vice of the Chinese is opium smoking. This to no certain extent has been practised for a long period, but of late years has increased. An opium house in Amoy is thus described by Mr. Smith.

"The first opium house which we entered was situated close to the entrance to the Taou-lais palace. Four or five rooms, in different parts of a square court, were occupied by men stretched out on a rude kind of couch, on which lay a head pillow, with lamps, pipes, and other apparatus for smoking opium. In one part of the principal room, the proprietor stood, with delicate steelyards, weighing out the prepared drug, which was of a dark, thick, semi-fluid consistency. A little company of opium smokers, who had come hither to indulge in the expensive fumes, or to feast their eyes with the sight of that which increasing poverty had placed beyond their reach, soon gathered around us, and entered into conversation. They formed a motley group of sallow, sunken cheeks, and glassy, watery eyes, as, with idiotic look and vacant laugh, they readily volunteered information, and described the process of their own degradation. There was to be seen the youth, who, just emerging from boyhood, had only commenced the practice a little time before, and was now hastening to a premature old age. There was the man of middle age, who for half his life, a victim of this pernicious indulgence, was bearing with him to an early grave, the wreck of his worn-out constitution. There was, again, the more elderly man, whose iron strength of frame could better ward off the slow, but certain advance of decrepitude, but whose bloated cheek and vacant stare told of the struggle that was raging within. There was, again, the rarely seen spectacle of old age, and the man of sixty lived yet to tell of forty years consumed in the seduction of this vice. They all assented to the evils and sufferings of their course, and professed a desire to be freed from its power. They all complained of loss of appetite—of the agonizing cravings of the early morning—of prostration of strength, and of increasing feebleness, but said that they could not gain firmness of resolution to overcome the habit. They all stated its intoxicating effects to be worse than those of drunkenness, and described the extreme dizziness and vomiting which ensued so as to incapacitate them for exertion. I subsequently visited about thirty other opium shops in different parts of the city. The people say that there are nearly a thousand such establishments in Amoy."

A confirmed opium smoker generally consumes daily about a mace of opium, which is equal to one drachm, or sixty grains, the price of which is about eight pence sterling, a large sum of money in China. In fact many of the poorer classes consume from a third to a fourth of their whole earnings in this pernicious practice.

Drunkenness does not appear to be a prevailing vice among the Chinese. In general, the people are temperate both in eating and drinking.—*Ibid.* T. R. B.

84. *A Case of Poisoning by Vinegar.* By A. H. David, M. D., Montreal.—A widow woman, with four children, took, as near as I could ascertain, a quart bowl full of common vinegar. It appears that she had been dull and low spirited for two or three days previous, in consequence of the neglect (as her friends suppose), of a person from whom she had received the most marked attention, and to whom she had been attached prior to her marriage with her late husband. When I saw her, about three hours after she had taken the vinegar, she was in bed, covered with a cold perspiration, trembling from head to foot, and apparently alarmed at every body, and everything around her. Her breathing was very laborious and hurried; her countenance perfectly wild, and the pupils dilated; the tongue was dry and cold; pulse 96 and full; the abdomen much distended, with extremely acute pain at the *scrobiculus cordis*, so much so, that the slightest pressure there, caused her to shriek out. She did not know any one about her, not even her own children, nor had she any recollection of anything that had happened, from the

time of taking the vinegar, which was about eleven o'clock at night, not even of her having gone to bed, which she was the last in the house to do. About one o'clock, the inmates were all awakened by her shrieking for cold water, of which she had drunk an enormous quantity, before I was called to see her. There was not any pain, heat, or constriction of the throat and fauces, but there were slight efforts to vomit. Having procured some sulphate of zinc, I gave her two scruples in a cup of water, which soon produced full vomiting, with great straining. I had then to leave her, but ordered full and repeated doses of carbonate of magnesia, till I could see her again, which I did about six hours after, and found her much relieved, and only complaining of headache, which left her after the operation of a dose of castor oil. Two days after, she was taken ill with a slight attack of continued fever, but is doing well.

Dr. David will find, that Taylor, in the last edition of his *Manual of Medical Jurisprudence*, quotes the case of Orfila, in which a female lost her life by taking strong vinegar.—*British American Journal of Medical Science*, September, 1847.

T. R. B.

—

85. *A New Method of distinguishing between Arsenical and Antimonial Spots.*—M. Cottereau, jun., proposes the following: Let the spots, obtained on porcelain capsules, be exposed to the vapour of phosphorus, and for this, place small fragments of the phosphorus on a flat surface, and hold over it the capsule bearing the spots. The process is accomplished at the ordinary temperature. All the arsenical spots disappear in the course of a few hours, while those of antimony resist the effect for a period longer than even fifteen days. Finally, however, they disappear at least in part; and if, at the end of this time, the capsules be held over a cup containing sulphuretted hydrogen in solution, the emanations from that gas will reproduce the spots; those of the arsenic being in the state of its yellow sulphuret, and those of antimony, of its red sulphuret. All these spots present precisely the form they originally had.—*Encyclographie*, from *Gazette Médicale de Paris*, 1846.

T. R. B.

—

86. *Poisoning by Strychnine.*—The following case by Dr. Theinhart, presents a remarkable example of the characteristic symptoms of this poison.

A student of pharmacy, of intemperate habits, on returning from a ball, where he had danced much and drank much, went to bed, and immediately afterwards swallowed a certain quantity of strychine. On the arrival of Dr. Theinhart, in about quarter of an hour after he had swallowed the poison, he confessed that he had taken nearly two grammes (thirty grains) of strychnine, dissolved in alcohol.

He was lying tranquil in bed, with a natural skin and pulse, and indeed his appearance was such, that Dr. T. refused to believe that the poison had been taken, although this was repeatedly asserted by the patient. Meanwhile, convulsive motions commenced over the whole system, the respiration was quickened, and the convulsions were succeeded by stiffness of the whole body. An emetic was given to check this, but without effect. At the end of a few minutes, a more violent general spasm came on, followed by a third and a fourth one, during which the patient uttered horrible cries. In half an hour, he was dead.

The tongue, gums and lips were violet coloured. So also were the fingers and toes. The first were convulsively retracted, and the last drawn in. The whole body was as rigid as a stick of wood, and slightly bent on itself.

During the slight intervals of consciousness, no satisfactory account could be obtained as to his sensations in the seat of the pain, which nevertheless was evidently felt in the region of the stomach. The neighbours heard loud cries before the arrival of the physician.—*Ibid.* from the *Gazette Médicale.*

T. R. B.

—

87. *Joanna Southcott.*—I copy from a magazine, published in 1815, the following certificate of the examination of the body of this female, who had numerous followers in her day in England, and who, for a long time, declared herself pregnant of a child that was to be the *Saviour of the world.* Her deluded disciples did not abandon the belief until death took her from them.

"We, the undersigned, present at the dissection of Mrs. Joanna Southcott, do

certify that no unnatural appearances were visible, and no part exhibiting any visible appearance of disease, sufficient to have occasioned her death; that a number of gallstones were found in the gall-bladder, and the intestines were unusually distended with flatus, and no appearance of her having been pregnant. The uterus was not distended, enlarged, or diseased, but on the contrary rather smaller than the usual size."

Signed by Dr. Reece, Dr. Sims, Dr. Adams, Mr. Clarke, Mr. Want, Mr. Cooke, Mr. Stanhope, Mr. Caton, Mr. Phillips, Mr. Darling, Mr. Forster, Mr. Whetherall, Mr. Stanton, Mr. Wagstaffe, Mr. Wilkinson. T. R. B.

—

88. *Latest Case of Supposed Spontaneous Combustion.*—The *Gazette Médicale* relates the following facts in a recent number. On the 6th of January last, the body of a man was found lying in bed, and in a state of combustion, by some persons who entered his bed-room in the morning. The chamber was filled with a dense smoke, and one of the witnesses asserted, that he saw playing around the body of the deceased, a small whitish flame, which receded from him as he approached. The clothes of the deceased, and the coverings of the bed were almost entirely consumed, but the wood was only partially burnt. There were no ashes, and only a small quantity of vegetable charcoal; there was, however, a kind of mixed residue, altered by fire, and some pieces of animal charcoal, which had evidently been derived from the articulations. The deceased was in the habit of carrying lucifer matches in his waistcoat pocket, and according to his usual practice, he had had a hot brick placed at his feet when he went to bed the preceding evening. Two hours after, his son and daughter-in-law passed by the door of his room, but there was nothing which attracted their attention. It was only the following morning early, that his grandson found his body in the state described. The deceased was seventy-one years of age. He was not fat, nor was he addicted to drunkenness. The temperature of the air was low, and there were no indications of electricity. The son and his wife were suspected of having murdered the deceased, and burnt the body in order to conceal the traces of the crime; and a Dr. Masson was commissioned to investigate the case. The body, which had been buried, was exhumed and examined. The cravat, partially burnt, was still around the neck, and part of a sleeve of the night shirt was found. The hands, completely burnt, were only attached to the forearms by some carbonized tendons, which gave way on the slightest touch. The thighs were completely detached, so as to resemble a wilful mutilation, but for the discovery of animal charcoal about them. From the facts, Dr. Masson (considering it impossible to ascribe these changes to the effects of accidental burning, and that, under common circumstances, they could only be produced by a violent combustion continuing for some time), drew the inference that the burning must have resulted from some inherent cause in the individual, probably roused into activity by the hot brick placed at the feet of the deceased. The burning once commenced, would be easily supported by the state of the tissues. Hence, the case was, in his opinion, to be referred to the class of spontaneous combustion. It is said that Orfila coincided with Masson in this opinion, and that the accused were acquitted.—*Atlas*, (London Newspaper,) Sept. 25th, 1847. T. R. B.

—

89. *Test for Arseniates.* By R. D. Thompson, M. D.—I may notice a simple and quick method of testing minerals containing arsenic in its various forms, phosphates, molybdates, vanadiates, &c. A few grains of the mineral to be examined are to be finely pulverized in an agate mortar, and introduced into a test tube, and boiled with bisulphohydret of ammonia for a few minutes. The mineral is partially decomposed; the sulphate of lead precipitates, while sulphate of arsenic, &c., is dissolved by the excess of the reagent. The tube is then allowed to stand at rest, and the supernatant liquor poured off or filtered. The excess of bisulphohydret of ammonia being removed by evaporation, the yellow sulphuret of arsenic precipitates. A molydate is detected at once, by the fine orange-red colour, which the reagent assumes when it is heated in contact with that mineral.

A vanadiate gives a dark colour, but possessing less of the red shade than the molybdate. The liquor filtered from the sulphuret of lead containing the vanadium in solution, has a green colour, becoming blue by the addition of hydrochloric acid.

Hence it appears that arsenic dissolved in bisulphohydret of ammonia does not alter the colour of that reagent, while the liquor gives a precipitate of orpiment by concentration. The liquor filtered from the sulphuret of molybdenum is colourless, or its hue is similar to that of the reagent, while the liquor derived from the vanadium precipitate is *green*.

The bisulphohydret affords a simple distinguishing test between metallic arsenic and antimony, where spots have been received on porcelain by Marsh's process. Arsenic dissolves in the reagent and leaves a yellow stain by evaporation. Antimony dissolves and leaves an orange stain. For this experiment, it is convenient to use the inside of the cover of a porcelain crucible.—*London, Edinburgh and Dublin Philosoph. Magazine*, October, 1847. T. R. B.

—

90. *Œnanthe Crocata.*—Many instances are on record of its destructive poisonous results in England, while in Scotland, Dr. Christison affirms that the plant is not poisonous at all. The existence of the yellow juice from which the species is named, is equally capricious. From the limited observations recorded in the *Phytologist* (an English Botanical Journal), it would appear that the yellow juice and active poisonous properties are coincident.—*British and Foreign Med. Review*, October, 1847. T. R. B.

—

91. *Malformation of the Female Organs a ground of Divorce.*—The English Ecclesiastical reports continue occasionally to furnish new cases for the investigation of the medical jurist. As the present is truly called a singular, and indeed, is almost an unique one, I will present an analysis of it, as given in *Robertson's Ecclesiastical Reports*, vol. i. p. 279.

The parties, whose names are concealed, were married on the 3d of February, 1842, the husband being aged about twenty-six years, and the wife twenty-five. The husband stated, in his application for a divorce, that they had lived together until the 11th of November, 1844, when she returned to her father's house; that the marriage had never been consummated, in consequence of a natural mal-conformation of the sexual organs; that he for some time was of opinion, that the inability was the result of a temporary obstruction, which would probably yield to simple exercise, aided by horse exercise, which he recommended to her, and in the use of which she long persisted; that, in the months of September and October, 1844, she, at his earnest entreaty, submitted to an examination by Drs. Bird and Lever, and upon their concurrent reports, as to her natural and irremediable mal-conformation and bodily defects, he for the first time, disclosed to his legal advisers the non-consummation of the marriage, and now applied for a divorce.

The answer contained a general denial of the statement of the mal-conformation and non-consummation, and stated, that in the months above named, in 1844, she, by reason of not having any child, and not on account of any natural or irremediable conformation or bodily defects, submitted, at her husband's earnest request, to medical examination.

On the 5th of April, 1845, Dr. Bird, Dr. Cape and Dr. Lever were appointed by the court, inspectors to examine the female. Their report is as follows:

"*April* 5, 1845. We, the undersigned, have this day particularly examined the parts of generation of Maria D., and we are unanimously of opinion, that she is undoubtedly capable of performing the act of generation, and of being carnally known by man. We are further of opinion, that although sexual intercourse can occur, yet conception cannot result." Signed as above.

This report leaves the matter rather mysterious, even to a medical man, and it is therefore necessary to state the evidence of Dr. Bird and Dr. Lever.

It seems that the former was consulted by the defendant for about a year past, for certain ailments, and in pursuing his inquiries respecting her indisposition, he found it absolutely necessary to make an examination, and the result was, that he ascertained that the external sexual organs were imperfect, or rather undeveloped; that she had the appearance rather of a girl not having attained puberty, than an adult; and internally, the vagina, which ought to have been of an internal depth of about three inches, was, in fact, as ascertained by admeasurement, only three-quarters of an inch in depth. "This was decidedly a natural malformation of the

parts, but not such, as I was enabled without further investigation, to pronounce whether remediable or irremediable, though it was certain, that if the former, it could only be effected by an operation. With the view of endeavouring to ascertain if an operation could be performed with a prospect of success, a more minute and careful investigation became necessary, and such was subsequently made by myself in conjunction with Dr. Lever, and it was then ascertained that the internal structure of the organs of generation were, in addition to the deformity already mentioned, further importantly deficient and imperfect, there not being any uterus. This was ascertained by me beyond the slightest possibility of doubt, and that the vagina formed an impervious *cul-de-sac*, and that, consequently, any operation would be wholly ineffective; and I depose that the said Maria D. is, therefore, irremediably incapable of procreation and conception, arising entirely from the organic deformities which I have explained, viz., the absence of the uterus and the irremediably impervious state of the vagina."

Dr. Bird further deposed, that on the examination made April 5th, 1845, with Drs. Lever and Cape, he had found that the vagina had become considerably elongated, being now of the depth of two inches, ascertained by actual admeasurement. "I cannot, therefore, depose that it is absolutely impossible for the vagina to attain a further elongation, but I am not acquainted with any means, medical or otherwise, capable of improving its existing condition." He further stated as his opinion, that the deformity did not entirely prevent her from having connection, as it had undoubtedly taken place, but such connection must be of an imperfect character, and allowing only a partial insertion of the penis. The husband had communicated to him the imperfect connection he had had, and with great declared suffering from pain on her part, but that he had attributed it at first, and for a long time, to a mere temporary obstruction capable of being overcome by further intercourse.

The testimony of Dr. Lever coincides in all the main points with that of Dr. Bird. He states, however, that the female admitted to him the total absence of the menses. As to the partial extension of the vagina, he was unable to say whether it had been caused by sexual intercourse or by artificial means.

On this testimony, the case came to trial. For the husband it was urged, that this is not the case of a woman who is barren; that undoubtedly would be no ground for a sentence of nullity—but of one who has no uterus, and in addition to that defect, has her vagina so formed as to preclude sexual intercourse in the proper sense of the term. If a woman be "*mulier viro inutilis*," or, as it is otherwise expressed, "*inhabilis*," arising from a natural irremediable defect, which is the case here, there is just ground for a sentence of nullity.

The counsel for the wife insisted that to entitle a party to a sentence of nullity, there must be an *utter impossibility* of sexual intercourse. This is not proved by the plea. The case is one of mere sterility, which is no ground for a sentence. Besides, there has been an improvement in the elongation of the vagina, and they will not undertake to depose that there may not be a further elongation. To justify the sentence prayed, the defect must be permanent and irremediable. Again, actual consummation has taken place.

The judge (Dr. Lushington) took time to consider the case, and on the 7th of June pronounced judgment.

The inspectors' report, if considered by itself, is clearly insufficient to justify a decree in favour of the husband. It declares the power of consummation, but denies the power of conception. But, two of them have been examined, and it is necessary to consider their evidence. Mere incapability of conception is not a sufficient ground whereon to found a decree of nullity. "The only question is, whether the lady is or is not capable of sexual intercourse, or if at present incapable, whether that incapacity can be removed?"

The effect of Dr. Bird's testimony is, that there may be connection of a very *imperfect character*. He cannot say that it is impossible that the vagina should obtain a further elongation, but it must always remain in a deformed and unnatural state. The evidence of Dr. Lever does not materially differ from this.

Now the evidence and the report do not convey the same idea. The latter would induce a belief, that the act of generation might take place in its ordinary

and perfect form; the evidence speaks of its very imperfect character. The report is silent as to the possibility of cure.

"Certainly, all the circumstances combined, form a case of no ordinary difficulty. It is no easy matter to discover and define a safe principle to act upon; perhaps it is impossible affirmatively to lay down any principle, which, if carried to either extreme, might not be mischievous. Very little assistance can be obtained from authorities. I must rather endeavour to find out what are the true principles of law and reason applicable to the case, following as far as practicable, or rather not contradicting, former decisions." Sexual intercourse, present or to come, is necessary to constitute the marriage bond between young persons. And this intercourse must be ordinary and complete, not partial and imperfect; yet it would not be proper to say, that every degree of imperfection would deprive it of its natural character. There must be degrees difficult to deal with; but if so imperfect as to be scarcely natural, I should not hesitate to say, that, legally speaking, it is no intercourse at all.

The evidence of the witnesses is somewhat ambiguous. As to conception, there is no doubt that the malformation is incurable, but it is to me doubtful whether they mean that it is incurable as to the mere coitus. If there is a reasonable probability that the lady can be made capable of the natural sort of coitus, I cannot pronounce this marriage void; but if she is not, and cannot be made capable of more than an incipient, imperfect and unnatural coitus, I would pronounce it void. Such an intercourse must cause disgust, lead to adulterous connection, or else force the husband to a state of quasi unnatural connection.

The discrepance between the report and the evidence is such as to prevent a decision until Dr. Cape is examined, and the following questions, in addition to the examination of the parties, are to be put to him:

1. Whether (without regard to the impossibility of conception) the lady was, at the time of his examination, capable of the act of generation in its natural and ordinary meaning, or only of incipient and imperfect coition?

2. Whether, if not capable of generation in its natural and ordinary meaning, but only of incipient and imperfect coition, such defect arises from malformation incapable of cure, so as to allow of the natural and perfect act of coition?

Dr. Cape, after mentioning his examination of the female in March, 1844, and his subsequent one in consultation with Drs. Bird and Lever, in April, says that during the latter he found the depth of the vagina increased in depth. It was precisely two inches; the natural depth would be from four inches to four inches and a half; that this state of things is decidedly a malformation of the sexual organs, positively irremediable; no operation could be performed to effect a cure; that she is capable of a restricted and limited connection, and not of one in its natural and ordinary meaning: it cannot be called perfect, though it is beyond incipient coition. It is just possible that a further, but very slight improvement might take place by continual, frequent sexual intercourse, or by mechanical means. "I will not swear that the vagina is impossible to be further elongated, but I do swear, that it could not be effected without endangering life, or running serious risk of doing so."

July 8. The cause came before the court again, with the additional evidence of Dr. Cape, and after hearing counsel thereon, the judge pronounced the marriage null and void. T. R. B.

HYGIENE.

92. *Egypt as a Winter Residence for Invalids.*—(*Monthly Journ. Med. Sci.*, Nov. 1847.)—Dr. Walter Bain accompanied a young gentleman in delicate health to spend the winter in Egypt, and having had his attention directed to the climate, and its influence on disease, has given the results of his observations:—

"In Cairo, lat. 30° N., during October and November, the thermometric range was as follows:—

	Thermometer.			Diurnal Range.		
Months.	Max.	Min.	Med.	Greatest.	Least.	Med.
October,	78°	67°	73°	10°	4°	7°
November,	74	60	64	11	2	5

"During this period, rain fell once, a slight shower of a few minutes' duration. In October, the waters of the inundation were rapidly subsiding, and in consequence, there was a considerable quantity of moisture in the air; but by November, the river had contracted within its banks, the water had disappeared from the ground, and the air become perfectly dry. Until November there was almost no wind, but with that month northerly breezes set in, and continued without any change during the entire winter. The winds exhibited a good deal of periodicity, blowing strongly during the day, thus moderating the extreme heat, and suffering a diminution of intensity, frequently amounting to complete cessation at sunset. During November the sky was beautifully clear, the air dry and elastic. The heat of the day was considerable, but very agreeable. The nights were mild, and dews of very rare occurrence.

"At the end of this month, we commenced the voyage up the Nile, and as a general rule, it was observed, that, in proportion as we sailed farther south, the midday temperature increased, while that of the night diminished. Rain fell once during the voyage—of ten weeks' duration—and dews were as unfrequent as at Cairo. The evenings were very mild, but as the night advanced, the temperature sunk so much, that we felt the air excessively cold. At Thebes, lat. 26° N., I had an opportunity of observing the thermometer for a week.

Thermometer.			Diurnal Range.		
Max.	Min.	Med.	Greatest.	Least.	Med.
81	68°	77°	12°	5°	9°

"In Nubia, the same phenomena were noticed, the only difference being, that the maximum and minimum temperatures were, the one greater, and the other less, than at Thebes.

"Our downward voyage commenced January 4th, 1847; and every day we felt the heat less, and the winds colder. At Thebes, for three days, I find that the thermometer ranged as follows:—

Days.	8 A. M.	Noon.	8 P. M.
January 15	64°	76°	66°
" 16	62°	75°	64°
" 17	63°	79°	67°

"The wind blew strongly against us during the entire voyage down the river, and was so cold that we could not expose ourselves to it without protection; and, when we reached Cairo, the weather was disagreeably cold for several weeks. Rain fell five times during February; the sky was cloudy, and the sun obscured. The thermometric range for the month was as follows:—

Max.	Min.	Med.
76°	57°	61°

"The maximum temperature stated in the table, was reached during the last days of the month, about which time the weather began to improve, and in a short while Cairo became as agreeable as before.

"The chief peculiarity of the Egyptian climate is its dryness, proved, by the foregoing observations, by the united testimony of travellers, but, above all, by the monuments on the banks of the Nile, the sculptured surfaces of which have retained, during a period of several thousand years, all the sharpness and polish of their finished state, and by the brightness of the colours which adorn the interior of temples and tombs, for ages exposed to the influence of the atmosphere. Moisture is found in the air only during the subsidence of the Nile, and even then it is rapidly abstracted by the arid sands of the desert, which hems in the valley of the river on every side. The heat of the summer months is said to be very great; but during the five months of the year spent by us in the country, it was not only tolerable, but very pleasant. In spring, the Egyptians are annoyed by the prevalence of a hot south-east wind, similar to the sirocco of Malta and the Italian

coasts, and, like it, also trying both to natives and strangers. It is called by the natives "Khamseen," or fifty-days wind, and usually sets in about the middle of March; but it is generally heralded by pilot blasts for several days before its appearance. During this season, the diseases peculiar to Egypt prevail with greatest intensity; but, if we except it, and the period during which the Nile is subsiding—when intermittents abound and plague usually begins—this country is said to be remarkably favourable to health and longevity.

"The climate of Egypt is liked by most Europeans, and many have chosen to live in Cairo in preference to any other place, solely on account of the atmosphere. Most of those who sojourned there during last winter, on account of health, derived much benefit, and several, who had formerly wintered in other places, gave it a decided preference. My friend improved very much during his stay. Pulmonary symptoms, which had begun in Scotland, disappeared on his arrival in Egypt, and were never afterwards thought of; and chronic bronchitis, with a cough which harassed myself incessantly, gradually became less severe, and, ere I left the country, had quite gone.

"Egypt offers to the invalid the advantages of a warm and dry winter residence, and, though the temperature is not so equable as that of some other places, it possesses the additional recommendation of being, perhaps, the most interesting country in the world, affording thus, with bodily ease and comfort, mental recreation of the highest order.

"The invalid who intends passing the winter in Egypt, should not land in that country before the middle or end of November, and, on reaching Alexandria, he ought to start for Cairo without delay. As in almost all cases, he must leave England in September, or early in October, he ought to arrange his voyage so as to delay somewhat in a latitude north of the Mediterranean. Any route may be chosen. Through France to Marseilles, or Germany to Trieste, are now common highways to the East; but, on the whole, I think the best way for the invalid to adopt is, to leave Southampton for Corunna, thence down through Spain and Portugal to Lisbon or Cadiz, from either of which ports he can find steamers to transport him to Malta and the Levant. This I deem a very agreeable route. The climate of Spain is finer than that of Germany, and even that of France, during the month of October; and, as it is customary to return through Europe, a passing glance at the Peninsula may thus be obtained without additional trouble or expense. Once in Cairo he should be in no hurry to proceed up the Nile. The short winter experienced by the Cairenes is during January and February; so these months ought to be spent in Nubia, the most southerly region to which a voyage can be made with comfort.

"Cairo and its environs afford sufficient amusement for a month, and by the end of December, the Nile voyage may be undertaken. Two months are usually spent on the river; by the invalid the voyage should be prolonged to the middle of February, by which time the weather in Cairo is generally agreeable. The error generally committed by those who undertake the ascent of the Nile, is that of starting too soon; going up into a very warm climate, and then descending to a latitude in which considerable cold is felt in winter. This was the mistake into which we fell, and I cannot too seriously warn all who are ailing, carefully to avoid it.

"Before leaving Britain, the invalid should provide himself with clothing of two kinds; one, the ordinary attire of Britain, the other, such as is worn in hot countries; everything else may, and ought, to be laid in at Alexandria or Cairo. In either of these towns every article may be provided for making the voyage, not only in comfort, but luxuriously; and in either place servants may be got without difficulty. To take anything from England or Malta involves very great expense, and to hire servants in either place is not only very expensive, but is the source of more annoyance than can be conceived; for though the Egyptian servants are, perhaps, the basest rascals on the face of the earth, they are not so accomplished in villainy as the Italian or Maltese.

"Travelling is thoroughly understood by the Arab dragomen, and it may be performed as comfortably in Egypt as in England; no fears, therefore, of privation or roughing, need deter any one from making the voyage. The hotels in Cairo and Alexandria are very good, and for a family, or such as study economy and quiet, houses may now be procured in both towns. The English language is alone

sufficient for the East, because most of the servants understand it; but, if Italian be spoken, the traveller's enjoyment will be greatly increased.

"Egypt should be left about the beginning or middle of March—circumstances, and the route to be taken on leaving, determining the precise time. If it be intended to return to England, the invalid should delay in Cairo or Alexandria till the middle of March, when he may leave for Malta with safety; but he ought not to proceed further north until the middle of April, unless he goes to Italy, and travels slowly through the Neapolitan and Roman states. Most persons who visit Egypt, however, make the tour across the desert to Syria, and, if circumstances permit, I would strongly advise all to perform it. The desert is full of interest; very different, indeed, from the idea usually entertained of it by Europeans; and as it forms the highway to a land associated with the earliest thoughts of every Christian, a journey through its wild and cheerless wastes greatly enhances the delight experienced at the first glimpse of the hills of Judea. To the invalid it possesses still other attractions. The climate is finer than that of Egypt, and the change of life there undergone, and the exercise which the traveller is obliged to take, are frequently of far more service in restoring health than any length of mere residence in any climate, and when improvement has already begun, there are few places better calculated to advance it.

"The journey across the desert may be accomplished as comfortably as the voyage on the Nile, and after a day or two, without the slightest fatigue. Last year numerous parties, and among the number many ladies, performed the trip, and all, without exception, bore testimony to the pleasure and benefit they derived from their wanderings.

"On leaving Egypt for Syria, there is a choice of routes, one a journey of thirty days, by Mount Sinai, Akaba, and Petra; the other, of twelve days, by El Arish and Gaza, on the south-east coast of the Mediterranean. To the invalid, I advise the longest, because, if improvement can be effected at all by climate, it must take place under the desert sky, and besides, it is the most interesting route. If he choose it, he ought to leave Cairo by the beginning of March, and thus enter Syria by the end of the month, leaving ample time for making the tour of Palestine, and being ready to sail from Beyrout to Marseilles by the steamer of the last week of April or first of May. By going to Marseilles, voyagers from the Levant now obtain free pratique in twenty-four hours, a comfort which those who have performed quarantine can appreciate. From Marseilles to England is a journey of four or five days, and in a few months, when part of the railways now constructing have been finished, will be much shorter.

"In bringing the above detached notices to a close, I would only express a hope, that no imaginary fears may deter medical men in recommending, or patients in adopting, the East as a residence and travelling ground during the winter. The annoyances to which the traveller is subjected are not very great, and are every day diminishing, and the expense of living and travelling is not greater than in other countries."

—

93. *Influence of Seasons on Health.*—In order to appreciate the influence of the seasons on the public health, we must proceed on an extensive scale: and the only source from which information can be drawn, without danger of too great errors, is found in the movements of the populations of hospitals and infirmaries. Going on this principle, M. Casper, of Berlin, offers the results of observations made on 155,000 cases of recent diseases, comprised in a period of seven years, from 1833 to 1840, the most extensive table yet made public. These 155,000 patients at Berlin are thus distributed, according to the season:—Summer, 40,700; Winter, 39,024; Autumn, 37,865; Spring, 37,748. Hence it follows, that in Berlin the greatest number of patients is in the summer; the least in the spring; and the numbers in spring and autumn are about alike. If, then, that season which causes the least amount of disease be regarded as the most healthy, summer is at the bottom of the scale, while spring is at the top,—speaking here of Berlin. Looking to the months in which disease is most prevalent, January and August occupy the first rank; then follow, with little difference between them, July, April, September, June, February, March, November and October; lastly, May and December; the two last furnishing fewest cases. If, instead of taking the number

of patients as a criterion of the relative salubrity of the seasons, we seek to determine it by the proportional mortality in a given population, the results become notably changed, and summer does not appear so insalubrious. In fact, of 55,609 deaths in Berlin, in seven years, the proportion was 14·10 in 100 in autumn; 24·71 in spring; 24·87 in winter; in summer, 26·31. The month of August has always proved the most insalubrious and fatal. Comparing these results at Berlin with those derived from the official documents respecting the sanatary state of Paris and Philadelphia, we shall see that Paris, from 1819 to 1826, lost 189,126 inhabitants, and in the proportion of 28·63 in 100 in spring; 25·29 in winter; 23·44 in summer; and 22·61 in autumn; whilst the city of Philadelphia numbered, from 1811 to 1820, 23,486 deaths, in the proportion of 31·19 in 100 in summer; 23·75 in spring; 23·89 in autumn; and 21·15 in winter. Thus, the law established by Hippocrates, on the relative influence of the seasons, does not hold good universally. At Berlin and Philadelphia, the highest amount of mortality is in summer; but at Paris, in spring. On the other hand, the minimum mortality is at Paris and Berlin in autumn; whilst at Philadelphia it is in winter. Thus, we may suppose these differences to be partly traceable to locality, soil, water, and other conditions of climate. One cannot otherwise understand how the maximum mortality is at one season in one place, at another, in another. Further, as MM. Quetelet and Villermé have remarked, this maximum and minimum may vary in the same country at different epochs. It follows, from a table by M. Casper, that at Berlin, in the eighteenth century, the maximum mortality was in spring, as it now is in Paris; and again, the minimum was at Berlin, in that century, in winter, whereas it is now in autumn. Temperature stands foremost among the conditions which notably make the influence exercised by the seasons to vary. It results, from the researches of M. Casper, that every extreme of temperature, at either end of the scale, exercises a disastrous influence on human life; and this applies to all the seasons indifferently, and by the very fact of sudden variation. M. Casper believes that he has also arrived at the law, that at almost every season the augmentation of atmospheric pressure increases, whilst the diminution decreases, the ratio of mortality—i. e., that the mortality is directly as the pressure. The preceding facts are chiefly taken from Dr. Casper's valuable essay, published last year at Berlin, and entitled "Denkwürdigkeiten zur Medicinischen Statistik und Staatsarzneikunde."—*Lancet*, Sept. 11, 1847.

MISCELLANEOUS.

94. *Epidemic Cholera.*—This disease has, for the second time, invaded Europe, and, as on its first appearance in 1831–2, it threatens to spread over the whole globe The present epidemic manifested itself in Sept. 1845, at Bokhara and Samarcand, and in the same year, at a point diametrically opposite, at Bagdad, in which city, containing 80,000 inhabitants, from 400 to 450 died daily. The disease thence followed the course of the pilgrims to Mecca, and in November, 1845, advanced towards Teheran, one of the chief cities of Persia, but did not appear in that city till June, 1846. The patients there seized with it did not suffer, it is said, from cramps or vomitings, but fell into a kind of lethargy, accompanied with paralysis. All remedies were unavailing, and those seized died at the end of from three to eight hours. Not less than 300 died every day, and of 130,000 people in the city, 9000 fell victims to the scourge. The epidemic declining there, then directed its course through the districts of Schirmun, Kasbin, and Kaschan; and in August approached Tauris, and then Astrabad—always pursuing a westward course. At Tauris, the malady did not appear with so great severity; little was complained of by patients except vomiting and cramps, which were relieved by medicines. In its course through Persia, the cholera did not always follow the direction of the winds, nor that of the chief roads or valleys, but its march was irregular, and large tracts were passed over.

In October, 1846, the cholera showed itself in the region of the Caucasus, but in a very mild form; and on the 13th of May, 1847, appeared at Tiflis. In that city, from the 13th of May to the 24th of June, but sixty-seven persons died out of

164 attacked, and amidst a population of 6000. The lower classes, exposed to various depressing agents, were those who suffered.

In the middle of July, the cholera advanced to New Russia, about the mouths of the Don, where every preparation had been made by the Government against its approach. In August, the disease continued to rage in Tiflis, and advanced to Erzeroum, Kars, and Koutaïs, as well as to some parts of the Black Sea—viz., Batoum and Redout-Khalé. At Erzeroum the malady was very mild, but at Batoum more severe. In the Caucasus, the Russian army suffered greatly from its ravages, and it has lately carried off some of the chief commanders,—diminishing in some detachments, but increasing in others. The tables of mortality in New Russia state, that of 639 seized, 501 have died.

On the 9th of September, the cholera reached Trebizond: from that day to the 15th, the epidemic increased; but from the 15th to the 18th, it declined. About 300 cases occurred in this period, of which 103 died; and the sanatary physician of the city declares, that if the malady be treated early, ninety out of 100 may be saved. On the 4th of September, Erzeroum, which had suffered in July and August, began to be free from the disease, whilst it had again broken out at Bagdad, but not so severely as before, and by the last courier was announced to be on the decline.

During September, the cholera continued to rage in Southern Russia, assuming a severe form, and carrying off, as reported, whole villages, but had not passed beyond Charkow. Riga was said, but, it would seem, erroneously, to be visited by the epidemic. On October the 5th, the Russian official reports announced that the malady pursued its course northward and westward, and that some cases had occurred at Orel, at Toula, at Saratof, and as far as the village of Pensa, only fifty leagues from Moscow. In this, its north-western route through the province of Astrakan, and to the borders of Walachia, and Moldavia, 7248 persons had been seized, of whom 3342 had died—*i. e.*, from the close of August, until the middle of September. The last accounts from Russia, however, state that the malady is on the decline, and that few cases are now met with in Saratof, Woronesch, Tambof, and Kasan; but that there is a fresh outbreak in Persia, whence the epidemic tends to Asiatic Turkey. It is, also, reported that the cholera has shown itself at Perecop, about fifty miles from Odessa; but that it is declining in intensity at Trebizond, and has disappeared from Tangarok and Marcanopel, on the shores of the sea of Asoph.

Towards the close of September, it was announced that the cholera had arrived on the frontiers of Gallicia, and that some cases had occurred in Silesia and Moravia. It has been more recently stated, that a case had presented itself in one of the hospitals of Vienna; but this wants confirmation.

From the preceding account, based on official documents, the approach of the cholera to this country is rendered morally certain; it follows pretty much the same route as heretofore; it is seen to be unstayed by climate; penetrating, as it does, towards northern Russia; to vary in intensity, and even in character, at different places; to pass over tracts of country; and not to follow, except a general north-westward course, any direction favoured by the physical features of the country, or the direction of the winds.

Upon the whole, the career of the present epidemic does not appear to be so fatal as that of the last; and it would, also, seem to differ in some characters, although presenting in all that peculiar one—viz., excessive collapse.—*Lancet*, Nov. 6, 1847.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

A remarkable Case of Pervious Urachus in an Adult. Reported to the Medical Society of Va.—By Robert G. Cabell, M. D.

The urachus is a solid ligament proceeding from the fundus of the bladder, between the linea alba and the peritoneum, and extending to the umbilicus, where it is lost in the adjacent cellular tissues, and aponeurosis and umbilical vessels. This cord is continuous with the longitudinal muscular branches of the bladder, and it has also in its structure a continuation of the circular fibres of that organ. It is situated about midway in the space between the umbilical arteries, which, investing the sides of the fœtal bladder, pass upwards to the umbilicus, and there unite. The peritoneum is reflected over these vessels, and when the urachus is put on the stretch, it is drawn into a fold of a falciform appearance. Bichat regards the urachus as a suspensory ligament of the bladder. It is of a conical shape, and, according to Cruveilhier, it is often found large at first, and then, after two or three inches, blending with the left umbilical artery.

In the fœtus of quadrupeds, the urachus is a large tube, transmitting urine from the bladder to the allantois, a bag between the chorion and amnion, having some connection with the nutrition of the fœtal animal. Opinions on this subject are, however, uncertain and hypothetical. In the human species it is a mere anatomical vestige of the canal of quadrupeds, and it is almost invariably found solid and *impervious*. Cruveilhier always found it solid, both in adults and the fœtus, and when found hollow, Bichat and all anatomists regard it as preternatural. Some very rare cases are recorded in which it is hollow, and when so, according to Sabatier, there is generally a congenital malformation and obliteration of the urethra. It thus appears that very few cases are met with, or are on record, where this cord is pervious, and such a malformation in adults may probably never be seen by anatomists who spend their lives in dissecting the human body. A remarkable instance of the above malformation and congenital defect lately fell under my observation.

On June 10th, 1847, I was requested by Dr. Hodges, of this city, to examine with him and Dr. Walk, of Chesterfield county, what was considered as an extraordinary *lusus naturæ*. The subject was a mulatto girl, of about 14 or 15 years of age, well grown, healthy, and of very handsome appearance. The navel presented a flattened, disk-like appearance, about the size of a shilling. The skin about it was loose, and in folds, but not so much so as to attract particular attention to it as a deviation from the ordinary formation. In the centre was a small aperture of the usual appearance, through which, when in the recumbent posture, she could pass her urine, and which, she said, she had done from her childhood and earliest recollection, at pleasure. Her urine was, however, passed, she observed, through the natural channel.

I then passed a small gum-elastic catheter through this umbilical orifice, which very readily passed, in a canal in the direction of the bladder, for six or seven inches, and when the wire was withdrawn, a fluid, evidently urine in odour and colour, passed through the instrument. I then passed the same instrument in the urethra, which was rather smaller than usual, and urine, of the same physical properties as that from the umbilicus, was

discharged through the catheter, showing that the two canals communicated with the bladder.

The girl, who presented a very neat and cleanly appearance, said that she experienced no uneasiness or inconvenience from this unnatural passage to her bladder, and, as said above, she could, at her pleasure, evacuate her urine by either channel.

Treatment of Chronic Lippitudo. By Isaac Hays, M. D., Surgeon to Wills Hospital.—Ophthalmia tarsi is generally a manageable disease, but occasionally cases are met with in which the affection, in consequence of neglect or bad management, has persisted for years,—the lids have become puffy, their lining membrane thickened and villous, causing more or less eversion (*ectropium*), their edges raw and sometimes ulcerated, the ciliæ irregular and scanty, or entirely lost; with photophobia, lachrymation, &c. Two such cases came under our charge during our recent service at Wills Hospital, and as they had resisted the usual remedies, I was induced to try the alternate application of tincture of iodine, and the solid sulphate of copper, at intervals of three days. The external surface of the lids was painted with the former; and three days afterwards the latter was freely applied over the thickened conjunctiva. Under this treatment both cases, one of them of 12 or 14 years continuance, have recovered, and we are induced to communicate the circumstance in hopes that this course may prove equally useful in the hands of others.

Vaginal Hysterotomy. Prof. G. S. Bedford, of New York, writes us:—I have recently been called to an extremely interesting case of midwifery, by my colleague Dr. Mott, and Dr. Clinton. The lady had been in labour 30 hours before I saw her. The womb was contracting with great energy, and neither Drs. Mott nor Clinton could detect the slightest vestige of an *os tincæ*. There was imminent danger of the patient's life. At the request of the above named gentlemen, I laid the womb open through the vagina, first making a bi-lateral section of the organ, and afterwards an incision through the anterior and posterior lips. The head was then distinctly felt, but very slight progress ensued. We waited twenty-four hours longer, the head still at the superior strait, the patient's strength much exhausted, and everything looking unpromising. I applied the forceps, and delivered the lady of a living child. Five weeks have now elapsed, and both are perfectly well.

This is the *second* time I have performed the operation of *vaginal hysterotomy*, and in both instances for absence of the *os tincæ*, and in each case both mother and child were saved. As far as I know, they are the only cases which have occurred in this country. My first case was in Dec. 1843, and was witnessed by Drs. Washington, Delmote, Doane, and others, and was published that year in the *New York Journal of Medicine*."

Prof. Bedford promises to send us a full report of this case.

DOMESTIC SUMMARY.

Foreign Bodies in the Air-Passages.—Dr. J. Mason Warren records, in the *Boston Medical and Surgical Journal*, (Dec. 15th, 1847,) four interesting cases of foreign bodies in the air-passages; and gives the following conclusions deduced from a review of these and similar recorded cases.

"1st. It is unsafe to trust to the chance of spontaneous expulsion, any substance, which is liable to have an increase of bulk from the heat and moisture of the

human body; as in all probability the swelling of this substance will render its exit impossible. This is still more true as regards children, from the comparatively small size of the larynx.

"2d. Metallic substances, or those not embraced under the preceding head, when engaged in the larynx, or lodged in the lungs, may be trusted with more impunity. If flat, they naturally present an edge to the tube, so as to permit the passage of air on either side. When lodged in the bronchus, such a substance becomes after a time enveloped in mucus, so as to obstruct the free act of respiration; it is then forced upwards, and in the struggle which ensues, the mucus is disengaged. The body then falls back, and remains quiescent until it again becomes covered with mucus, when the process of dislodgment is repeated. Sometimes, in the violent cough which occurs at the change of place of this body, it is forced out into the mouth and swallowed, or ejected; at others. by coming up suddenly, when the patient's attention is distracted, it takes the larynx, as it were, by surprise, and easily escapes.

"An interesting case of this latter class occurred in a little girl, a patient of Dr. Hale, in whom tracheotomy was performed by Dr. J. C. Warren, for the removal of the wooden stopper of an inkstand, which had been sucked into the trachea. As soon as this passage was opened, all irritation subsided, the foreign substance settled down into the bronchus, and although the wound was kept open a week, and attempts made to dislodge it, they were without avail. Some months afterwards, as the patient was looking out of a window, very intently watching the passing of a military company, the substance came up without effort into the mouth, and was at once expelled.

"3d. If the substance is fixed in the bronchus, and the patient young, the prospect of seizing it by instruments introduced through the wound, and carried down in the direction of the lungs, is extremely small. In fact I do not know of a single successful case upon record, with the exception of one, in which Mr. Liston opened the trachea of an adult, and introducing the forceps with some difficulty, seized a bone, which had become engaged in the right bronchus.

"4th. Some doubts will arise, however, as to the propriety of leaving in any case a foreign substance for a period of time in the lungs, without an effort to remove it. For although it may finally become detached and be ejected, as it frequently is, after remaining many months or years imbedded in the substance of the lungs, or stowed away in the bronchia. tubes, yet fatal organic lesions are not uncommonly the result. The judgment of the surgeon must therefore be determined by the circumstances of the particular case.

"It is remarkable in how great a number of these cases, which we find recorded as having occurred in children, the substance introduced was a common garden bean. Dr. Twitchell, of Keene, N. H., in the *New England Quarterly Journal of Medicine and Surgery*, mentions two instances, in which he operated with success. Many of a similar character may be found, by looking through the different periodicals.

"Should another case of this kind occur to me, I should at once perform the operation of tracheotomy, and by a free use of ether, attempt to allay the irritability of the air-passages, so as to allow a more easy exploration by instruments, than is generally afforded in the natural state."

—

Application of the Nitrate of Silver to the Larynx in Croup.—Dr. Charles Ware records, in the *Boston Med. and Surg. Journ.*, (Dec. 22d, 1847,) a case of membranous croup successfully treated by the application of a solution of nitrate of silver (one drachm of the salt in one ounce of water) to the larynx by means of a piece of sponge attached to a whalebone staff. The disease, in this case, was obviously limited to the trachea, if not to the larynx, and, in this respect, was peculiarly favourable for this treatment.

Dr. Blakeman has also recorded, in the *New York Journ. of Med.*, (March, 1847,) two cases of membranous croup successfully treated by the same means.

—

Chloride of Gold in Granular Lids.—Dr. W. Clay Wallace recommends (*Boston Med. and Surg. Journ.*, Nov. 3) a solution of six or eight grains to an ounce of water as vastly superior to the nitrate of silver for the cure of chronic granular lids; in recent cases, he says, it is inferior to the first mentioned application.

Traumatic Tetanus cured by Strychnine.—Dr. P. M. Kollock relates, in the *Southern Medical and Surgical Journal*, (Oct., 1847,) a case of traumatic tetanus, occurring in a negro girl, which terminated favourably under the use of strychnine, in the dose of $\frac{1}{12}$th of a grain every two hours.

Rigidity of the Os Uteri treated by Injections of Belladonna.—Dr. A. H. Cenas records, in the *New Orleans Med. and Surg. Journ.*, Nov. 1847, four cases of rigidity of the os uteri, in which he administered a watery solution of the extract of belladonna by injection into the vagina with advantage. Dr. C. thinks, that the want of success which some practitioners have met with, is owing to their mode of using it. He says, to secure the direct contact of the article, a watery infusion of the extract should be applied by means of an ordinary vagina syringe.

Dr. Joseph Eve, of Georgia, recommends the same practice.

Ether Inhalation in Intermittent Fever.—It is stated, in the *Illinois and Indiana Med. and Surg. Journ.*, (Oct. and Nov., 1847,) that Mr. J. W. Freer, a pupil in the Chicago Hospital, has employed ether in intermittent fever, "with the most delightful results." "Two or three inhalations invariably arrested the paroxysm *instantaneously* during the cold stage, brought on diaphoresis, and in cases where there was no unusual exertion, the paroxysms have not returned."

Statistics of the Medical College of the United States.—The following table, compiled from the published catalogues, exhibits the number of students and graduates, in most of the Medical Schools in the United States, for the Session 1846–7. We regret that there are several blanks in the table, which we are unable to fill, some schools having failed to furnish us with their catalogues.

Medical Schools.	Students.	Graduates.
University of Pennsylvania,	411	163
Transylvania University,	205	64
Harvard University, Boston,		
College of Physicians and Surgeons, N. Y.,	194	51
Medical Department University of the City of N. Y.,	410	123
Ohio Medical College,	170	53
Medical Institution of Geneva College,	158	43
Med. Dep. of Willoughby College, (Cleveland, Ohio,)	160	
Albany Medical College,	100	32
University of Louisville,	349	75
Western Reserve College,	216	
Franklin Medical College,	17	5
Pennsylvania Medical College,	95	33
Jefferson Medical College,	492	177
Rush Medical College, (Chicago,)	70	16
University of Maryland.		
Medical College of Georgia,	106	33
Med. Dep. Hamp. Sidney College,	75	17
Med. College, State of South Carolina,	204	74
Med Dep. Univ., Missouri, (St. Louis,)	102	28
Indiana Medical College, (Laporte,)	104	19
Berkshire Medical Institution,		42
Medical College of Louisiana,	166	27
Medical School of Maine, (Brunswick.)		
Vermont Medical College, (Woodstock,)	96	
Yale Medical College,		28
Castleton Medical College,	131	42
Memphis Medical College,	55	
New Hampshire Medical School, (Hanover.)		
Buffalo Medical College,	67	17
Washington Medical College, Baltimore.		
Med. Dep. Columbian College, (Washington.)		
Med. Dep. St. Louis University, (St. Louis,)		13
Med. Department of Illinois College,	39	13

UNIVERSITY OF PENNSYLVANIA, MEDICAL DEPARTMENT.

SESSION OF 1848-49.

The Medical Lectures will commence on Monday, October 16th, and be continued under the following arrangement, to the end of March ensuing.

Theory and Practice of Medicine, - - - -	By NATHANIEL CHAPMAN, M. D.
Anatomy, - - - - - - - - - -	" WILLIAM E. HORNER, M. D.
Materia Medica and Pharmacy, - - - -	" GEORGE B. WOOD, M. D.
Chemistry, - - - - - - - - -	" JAMES B. ROGERS, M. D.
Surgery, - - - - - - - - - -	" WILLIAM GIBSON, M. D.
Obstetrics and the Diseases of Women and Children,	" HUGH L. HODGE, M. D.
Institutes of Medicine, - - - - - -	" SAMUEL JACKSON, M. D.

Clinical Instruction at the Pennsylvania Hospital, by GEORGE B. WOOD, M. D., on Medicine; and by GEORGE W. NORRIS, M. D., on Surgery.

Demonstrative Instruction in Medicine and Surgery, twice a week, by the Professors of the Medical Faculty, assisted by W. W. GERHARD, M. D., and HENRY H. SMITH, M. D.

The rooms for Practical Anatomy will be open from October 1st to the end of March ensuing, JOHN NEILL, M. D., Demonstrator.

Preliminary Lectures will be delivered daily from the 2d to the 14th of October, inclusive.

Amount of Fees for Lectures in the University, $105; Matriculating Fee (paid once only), $5; Hospital Fee, $10; Practical Anatomy, $10; Graduating Fee, $30.

The Commencement will take place early in April.

W. E. HORNER, M. D., *Dean of the Medical Faculty,*
No. 386 *Chestnut Street, above Thirteenth, opposite the U. S. Mint.*
Philadelphia, March 6th, 1848.

G. W. CARPENTER'S

COMPOUND FLUID EXTRACT OF SARSAPARILLA.

This preparation was introduced about 18 years since by the proprietor, and was the first article of the kind known in the United States at that time. The officinal preparations being the Compound and simple Syrups, and the decoction.

The first was weak and inefficient, and the latter was required to be made fresh every day. These and the solid extract were the only preparations then in use.

The Fluid Extract of Sarsaparilla as then introduced by Mr. Carpenter was considered by the Medical Faculty of Philadelphia a great improvement, and was extensively prescribed in public institutions and private practice, by the most eminent physicians. The advantage of this preparation over the Syrup and the decoction was so strikingly manifest, that Professor Gibson, of the University of Pennsylvania, recommended it in his professional chair to his class, as superior to any of the preparations of Sarsaparilla then in use.

Professor Eberle, in the last edition of his Therapeutics, vol. ii. p. 206, makes the following remarks:—" Carpenter's Compound Fluid Extract of Sarsaparilla is a very neat and excellent preparation. It possesses all the active properties of the root in a highly concentrated state, a tablespoonful of it being equivalent to a pint of the ordinary decoction. I have used it in several instances with decided benefit. From the smallness of the dose, it is peculiarly adapted for administering this remedy to children, &c. &c."

Professor Dewees, in his Practice of Medicine, alludes in like manner to the superiority and efficiency of this preparation.

Professor Frost, of the Medical College of South Carolina, has written to the proprietor on the beneficial effects of this medicine, united with small doses of per-chloride of mercury, in cases of secondary syphilis, and his high opinion of this preparation, and its great advantages over the ordinary preparations of Sarsaparilla.

Numerous quotations from other distinguished medical writers could be given, highly commendatory of this preparation.

The design of the proprietor, in the preparation of this Extract, was entirely for the use of country practitioners, as being a much more convenient and active preparation than the Syrup or Decoction. It was not intended to be extolled by newspaper advertisements or paraded in handbills for the masses of the community, but as before said, for the use of the Medical Faculty alone, and it is gratifying to know that its use has been chiefly so confined. It is on this account that highly distinguished and eminent members of the Medical Faculty have given it support, including the professors of the most prominent Medical Colleges in this city and elsewhere.

The celebrity which it acquired, and the success which attended its exhibition, has called forth a host of articles in imitation of it, and manufacturers without number are engaged in making preparations, which they call by the same name, and imitate as closely as possible in external character, but which are essentially different in the mode of preparation, and many of them very doubtful of being what they represent; all which, it is hoped, will be observed by the practising physician, and the proper caution taken by them in purchasing or prescribing it.

Various opinions are entertained as to the remedial properties of Sarsaparilla. Some ascribe to it extraordinary power in Chronic Rheumatism, also in Scrofula, and many other local and constitutional diseases.

There are some who doubt its efficacy, but their number are comparatively few. A great many quotations of distinguished authors could be cited in its support in a variety of diseases. It may be sufficient at present to quote an interesting paper, published in the Medico-Chirurgical Review for July, 1830, on the subject of the Extract of Sarsaparilla in Venereal Affections, by Benj. Travers, F. R. S. &c. Speaking of syphilis, and diseases arising from the excess of mercury, he states, "that no remedy next to the adjustment of diet is equal to the Extract of Sarsaparilla; its power is extraordinary, more so than any other drug I am acquainted with. It is in the strictest sense a tonic, with the invaluable attribute, that it is applicable to a state of the system so sunken, and yet so irritable as renders other substances of the tonic class unavailable or injurious."

"We take the liberty of marking in italics," says the distinguished editor Dr. Johnson, "the passage respecting Sarsaparilla, because we most cordially concur with Mr. Travers in the statement which it contains in favour of the Extract of Sarsaparilla."

Its use in this city, and in the various parts of the United States, fully corroborate the above statement of the distinguished surgeon, Mr. Travers, seconded by the eminent editor, Dr. Johnson. A number of cases of secondary syphilis, mercurial and scrofulous diseases, in the incurable wards of our public institutions, have entirely recovered after having resisted every other mode of treatment which could be devised. These cases furnish striking examples of the salutary effects of this medicine, in arresting some of the most inveterate diseases after the glands were destroyed, and the bones already affected.

It is well known that Sarsaparilla forms the chief ingredient in the various Panaceas, and other nostrums paraded in the newspapers for the cure of scrofula.

We hope Physicians who have not yet given this preparation a trial, will be induced to prescribe it, and be able to judge of its merits by their own experience, which we feel confident will be satisfactory.

G. W. CARPENTER, & CO.,
No. 301 *Market Street, Philadelphia.*

N. B.—Physicians, Druggists, and Country Merchants will be supplied with Drugs, Medicines, Surgical Instruments, Paints, Glass, Oils, and every article in their line of the best quality, and as low as those of like quality can be had from any other House in this City, New York or Boston, and we respectfully solicit their patronage. Their orders will meet with prompt attention, and a liberal credit, when desired, will be extended to those who furnish satisfactory testimonials of their responsibility.

G. W. C. & CO.